A

I appreciate the humor, but the PTO would not
↳ eliminate

APPROPRIATE BUT AWESOME TITLE OF THE INVENTION

[INSERT TITLE HERE]

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] [Not Applicable]

- "constraints/variables" and "operational parameters" are vague
  ↳ But you define them later
- This is very well-written. Good Job
- Still missing a couple of pieces at the end

DETAILED DESCRIPTION OF THE INVENTION

[0009] Figure 1 illustrates a communication system 100 according to an embodiment of the invention. The communication system 100 includes an advertiser computing device 110, a global positioning system (GPS) satellite 120, a smartphone 130, an light-emitting diode (LED) display system 140, a central server 150, and a communication network 101. In the present embodiment, the advertiser computing device 110 is a Personal Computer (PC). The advertiser computing device 110 includes an advertiser interface 111 and a wireless transceiver 112. The smartphone 130 includes a user interface 131, a global positioning system (GPS) 132, a sound system 133, a wireless transceiver 134, and a and a memory unit 135. The LED display system 140 includes a light display 141, a wireless transceiver 142, and a memory unit 143. In the present embodiment, the communication network 101 is an Internet. The communication network 101 includes a network transceiver 102. The central server 150 includes a data storage unit 160, a wireless transceiver 170, an internal clock 180, and an auction processing unit 190. The data storage unit 160 includes a live advertisement database 161, an archived advertisement database 165, and an accounts database 166. The advertiser display group file 162 includes a display image data 163, and constraints variables 164. The accounts database 166 includes an advertiser account file 167 and a user account file 168.

[0010] In the communication system 100, the smartphone 130 is in wireless connection with a GPS satellite 120. The GPS 132 is electrically connected to the smartphone 130. The advertiser computing device 110 transmits data to and receives data from the network transceiver 102 through first wireless connection 103. More particularly, the network transceiver 102 transmits data to and receives data from the wireless

transceiver 112 of the advertiser computing device 110. The network transceiver 102 transmits data to and receives data from the central server 150 through the internet connection 104. More particularly, the network transceiver 102 transmits data to and receives data from the wireless transceiver 170 of the central server 150. The central server is electrically connected to the data storage unit 160, the internal clock 180, and the auction processing unit 190. The network transceiver 102 transmits data to and receives data from the smartphone 130 through the wireless connection 105. More particularly, the network transceiver 102 transmits data to and receives data from the wireless transceiver 134 of the smartphone 130. The smartphone 130 is electrically connected to the sound system 133 and the memory unit 135. The LED display system 140 transmits data to and receives data from the smartphone 130 through wireless connection 106. In the present embodiment, the wireless connection 106 is a Bluetooth connection. More particularly, the wireless transceiver 142 of the LED display system 140 transmits data to and receives data from the wireless transceiver 134 of the smartphone 130. The LED display system 140 is electrically connected to the light display 141 and the memory unit 143.

[0011] In operation, the communication system 100 involves six main components: the advertiser computing device 110, the communication network 101, the central server 150, the GPS satellite 120, the smartphone 130, and the LED display system 140. Upon entry of data from the advertiser interface 111 of the advertiser computing device 110 (see discussion of Figure 18), input data indicative of an advertiser identifier data, comprising username data, password data, and banking account data (see discussion of Figures 2 and 5) is transmitted from the advertiser computing device 110 to a network transceiver 102 through a wireless connection 103. The input data indicative of the advertiser identifier

data is stored in the advertiser account file 167 in the accounts database 166. Upon entry of data from the user interface 131 of the smartphone, input data indicative of a user identifier data, comprising username data, password data, and banking account data, and a home location data (see discussion of Figures 2 and 6) is transmitted from the smartphone 130 to a network transceiver 102 through a wireless connection 105. The input data indicative of the user identifier data and the home location data is stored in the user account file 168 in the accounts database 166.

[0012] Upon entry of data from the advertiser interface 111 of the advertiser computing device 110 (see discussion of Figure 18), input data indicative of a display image data 163 and constraints variables 164 is transmitted from the advertiser computing device 110 to a network transceiver 102 through a wireless connection 103. The input data indicative of the display image data 163 and constraints variables 164 is then relayed from the network transceiver 102 to the wireless transceiver 170 of the central server 150 through an internet connection 104. Upon the input data indicative of the display image data 163 and constraints variables 164 being received at the wireless transceiver 170, the input data is stored in an advertiser display group file 162 in a live advertisement database 161 at the data storage unit 160.

[0013] Upon selection of initiation representation from the user interface 131 of the smartphone 130 (see discussion of Figure 14), the smartphone 130 generates an input data indicative of a current GPS location data (see discussion of Figure 3 and 9). The data indicative of the current GPS location data is communicated wirelessly from the GPS satellite 120 to the GPS 132 of a smartphone 130. Upon the input data indicative of the current GPS location data being received at the GPS 132, the data is stored at the memory

unit 135 of the smartphone 130. The input data indicative of the current GPS location data is then relayed from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 170 of the central server 150. Upon the input data indicative of the current GPS location data being received at the wireless transceiver 170 of the central server 150, the internal clock 180 of the central server 150 records the time the input data indicative of the current GPS location data was received as a current time data (see discussion of Figure 9). The current time data is then stored in the archived time data in user account file 168 at the data storage unit 160 (see discussion of Figure 2). Furthermore, upon the input data indicative of the current GPS location data being received at the wireless transceiver 170 of the central server 150, the input data is compared to constraints variables 164 in an advertiser display group file 162 in the live advertisement database 161 at the data storage unit 160. The central server 150 retrieves the advertiser display group file 162 from the live advertisement database 161 and sends the advertiser display group file 162 to the auction processing unit 190. The current GPS location data is stored in the archived GPS location data in user account file 168 at the data storage unit 160 (see discussion of Figures 2 and 9).

[0014] Further describing the operation of the system 100 and, in particular, operation of the central server 150, the pre-determined operational parameters 191 govern the process by which the auction processing unit 190 compares and associates data stored in the advertiser display group file 162 to the input data indicative of the current GPS location data (see discussion of Figure 3 and 9). The constraints variables 164 set the conditions as to when the input data indicative of the current GPS location data is associated with an advertiser display group file 162 in the live advertisement database 161

at the data storage unit 160. The constraints variables 164 include, but are not limited to, a time interval data, including start time data and end time data, a location center point data, a location radius data, a display specification data, a maximum price data, a maximum instances data, and a budget data (see discussion of Figures 2 and 10). The central server 150 retrieves the display image data 163 in the advertiser display group file 162. The wireless transceiver 170 of the central server 150 transmits the display image data 163 to the network transceiver 102. The display image data 163 is then relayed from the network transceiver 102 to the wireless transceiver 134 of the smartphone 130.

[0015] For example, in one embodiment, the pre-determined operational parameters 191 set 30-second limit on the display image data, and a 1-hour interval for the time interval data.

[0016] In another embodiment, an input indicative of a location center point data and a location radius data is transmitted from a touch-sensitive display of an advertiser interface representative of a map (see discussion of Figure 18).

[0017] Upon the display image data 163 being received at the wireless transceiver 134 of the smartphone 130, the display image data 163 is then relayed from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 142 of the LED display system 140. Upon the display image data 163 being received at the wireless transceiver 142 of the LED display system 140, the display image data 163 is stored in the memory unit 143 of the LED display system 140. The LED display system 140 retrieves the display image data 163 stored in the memory unit 143 of the LED display system 140 and sends the display image data 163 to the light display 141. Upon the display image 163 being sent to the light display 141, the LED display system 140 transmits a completion signal from

the wireless transceiver 142 of the LED display system 140 to the wireless transceiver 134 of the smartphone 130 (see discussion in Figures 10 and 11). The completion signal is then relayed from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 170 of the central server 150.

[0018] For example, in one embodiment, the LED display system is a bicycle spokes LED lights on front, back, or front and back wheels.

[0019] In another embodiment, the display image data is in JPEG format, PNG format, AVI format, or MOV format.

[0020] Upon the completion signal being received from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 170 of the central server 150, the central server 150 updates the corresponding advertiser display group file 162 and the accounts database 166 to reflect the completion of display image data 163 transmittance. The pre-determined operational parameters 191 given the conditions set by the constraints variables 153 in the corresponding advertiser display group file 162 govern the process by which the data storage unit 160 is updated upon receiving the completion signal from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 170 of the central server 150. The update includes, but is not limited to, a change in input value indicative of a budget data of constraints variables 164 in the advertiser display group file 162 in the live advertisement database 161, a change in input value indicative of a advertisement count data in the advertiser account file 167 in the accounts database 166, or a change in input value indicative of earnings data in the user account file 168 in the accounts database 166 (see discussion of Figures 10 and 11).

[0021] The central server 150 then transfers the corresponding advertiser display group file 162 of the transmitted display image data 163 from the live advertisement database 161 to the archived advertisement database 165 at the data storage unit 160. The pre-determined operational parameters 191 given the conditions set by the constraints variables 153 in the corresponding advertiser display group file 162 govern the process by which the advertiser display group file 162 is transferred from the live advertisement database 161 to the archived advertisement database 165 at the data storage unit 160 (see discussion of Figure 12).

[0022]] The smartphone 130 continues to generate an input data indicative of the current GPS location data communicated wirelessly from the GPS satellite 120 to the GPS 132 of a smartphone 130, then relayed from the wireless transceiver 134 of the smartphone 130 to the wireless transceiver 170 of the central server 150. Upon the input data indicative of the current GPS location data being received at the wireless transceiver 170 of the central server 150, the input data indicative of the current GPS location data is stored in the archived GPS location data in user account file 168 at the data storage unit 160 (see discussion of Figures 2 and 9).

[0023] In another embodiment, the system 100 further includes additional smartphones.

[0024] In another embodiment, the system 100 further includes additional advertiser computing devices.

[0025] In an alternative embodiment, the system 100 further includes additional LED display systems.

[0026] In another embodiment, the live advertisement database 161 further includes additional advertiser display group files.

[0027] In another embodiment, the archived advertisement database 165 includes one or more advertiser display group files.

[0028] In another embodiment, the accounts database 166 includes additional advertiser account files and/or user account files.

[0029] In another embodiment, the accounts database 166 includes additional advertiser account files and/or user account files.

[0030] In an alternative embodiment, an advertiser computing device and/or a smartphone may be, but is not limited to, one or more of a cellular phone, a mobile phone, a laptop, a tablet, a personal digital assistant (PDA), a vehicle-based control panel, a vehicle having an integrated computer system, a smartwatch, Google Glass, other wearable computer devices, personal computer device, and other mobile data network connected devices.

[0031] In an alternative embodiment, a network transceiver may be, but is not limited to, one or more of a cell tower or a WIFI transceiver.

[0032] In an alternative embodiment, a wireless connection may be, but is not limited to, a wired connection, other optical connections, a WIFI connection, a Bluetooth connection, a UHF connection, an electrical connection, and/or other wireless connection according to any of the IEEE 802.11 standards.

[0033] In an alternative embodiment, the internet connection may be, but is not limited to, a wireless internet connection, a wired internet connection, such as intranets,

local area networks (LANs), cable-broadband internet connection, a DSL connection, and/or the like. Additional computing devices such as routers, network switches, hubs, modems, base stations, and/or the like may be employed to facilitate communications.

[0034] In an alternative embodiment, a server may be, but is not limited to, another storage terminal, memory unit, or/and the like.

[0035] Figure 2 illustrates a detailed embodiment of the data storage unit 160 of the central server 150 that is part of the system 100 (see discussion of Figure 1). The data storage unit 160 includes the live advertisement database 161, the archived advertisement database 165, and the accounts database 166. The live advertisement database 161 includes the advertiser display group file 162. The advertiser display group file 162 includes the display image data 163 and the constraints variables 164. The constraints variables 153 include a time interval data 201, a location center point data 202, a location radius data 203, a display specification data 204, a maximum price data 205, a maximum instances data 206, and a budget data 207. The accounts database 166 includes the advertiser account file 167 and the user account file 168. The advertiser account file 167 includes an advertisement count data 220 and an advertiser identifier data 221. The user account file 168 includes a user identifier data 240, a home location data 241, an archived GPS location data 242, an archived time data 243, and an earnings data 224.

[0036] In operation, upon receiving an input data from the advertiser computing device 110 indicative of a time interval data 201, a location center point data 202, a location radius data 203, a display specification data 204, a maximum price data 205, a maximum instances data 206, and a budget data 207 through the wireless signal 103 from a wireless transceiver 112 of the advertiser computing device 110 to the network transceiver 102 to

the wireless transceiver 170 of the central server 150, the time interval data 201, the location center point data 202, the location radius data 203, the display specification data 204, the maximum price data 205, the maximum instances data 206, and the budget data 207 is stored in the advertiser display group file 162 in the live advertisement database 161.

[0037] Upon receiving an input data from the advertiser computing device 110 indicative of an advertiser identifier data 221, comprising a username data, a password data, and a banking account data, through the wireless signal 103 from a wireless transceiver 112 of the advertiser computing device 110 to the network transceiver 102 to the wireless transceiver 170 of the central server 150, the advertiser identifier data 221 is stored in the advertiser account file 167 in the accounts database 166.

[0038] Upon transmitting a display image data 163 to the smartphone 130 through a wireless connection 105 from the wireless transceiver 170 of the central server 150 to the wireless transceiver 134 of the smartphone 130, the value indicative of one count in the advertisement count data 220 is added to the advertiser account file 167 in the accounts database 166 and the value indicative of earnings is added to the earnings data 244 in the user account file 168 in the accounts database 166 (see discussion of Figures 10 and 11).

[0039] Upon receiving an input data from the smartphone indicative of a user identifier data 240, comprising a username data, a password data, and a banking account data, and a home location data 241 through the wireless signal 105 from a wireless transceiver 134 of the smartphone 130 to the network transceiver 102 to the wireless transceiver 170 of the central server 150, the user identifier data 240 and the home location data 241 is stored in the user account file 167 in the accounts database 166.

[0040] Upon receiving an input data indicative of current GPS location data (see discussion of Figure 3) from the smartphone 130 through a wireless connection 105 from the wireless transceiver 170 of the central server 150 to the wireless transceiver 134 of the smartphone 130, the central server 150 records time the input data was received as current time data. Then, the central server 150 stores the current GPS location data as an archived GPS location data 242 and the current time data as an archived time data 243 in the user account file 168 in the accounts database 166 (see discussion of Figure 9).

[0041] Figure 3 illustrates a detailed embodiment of the smartphone 130 that is part of the system 100 (see discussion of Figure 1). The smartphone 130 includes the user interface 131, the GPS 132, the sound system 133, the wireless transceiver 134, the memory unit 135. The memory unit 135 includes a current server connection data 301, a current LED connection data 302, and a current GPS location data 303.

[0042] In operation, the smartphone 130 transmits a wireless signal 105 to the central server 150 for wireless connection. When an acknowledgement signal from the central server 150 to network transceiver 102, then to a wireless transceiver 142 of a smartphone 130 is received, the smartphone transmits an output indicative of a current server connection data 301 that was stored in the memory unit 135 of the smartphone 130 to the central server (see discussion of Figure 13). Similarly, the smartphone 130 transmits a wireless signal 106 to the LED display system 140 for wireless connection. When an acknowledgement signal from the LED display system 140 from wireless transceiver 142 of the LED display system 140 to the wireless transceiver 134 of the smartphone 130 is received, the smartphone transmits an output indicative of a current LED connection data 302 that was stored in the memory unit 135 of the smartphone 130 to the central server.

The GPS satellite 120 transmits an output data indicative of GPS location to the GPS 132 of the smartphone 130. The GPS location data is stored at the memory unit 135 of the smartphone 130 as a current GPS location data 303. The smartphone 130 transmits the current GPS location data 303 through the wireless connection 105 from the wireless transceiver 134 of the smartphone 130 to the network transceiver 102, then relayed to the wireless transceiver 170 of the central server 150.

[0043] Figure 4 illustrates a detailed embodiment of the LED display system 140 that is part of the system 100 (see discussion of Figure 1). The LED display system 140 includes the light display 141, the wireless transceiver 142, and the memory unit 143. The memory unit 143 includes a current LED display specification data 401, a current LED battery power data 402, and a current LED minimum velocity data 403.

[0044] In operation, when the smartphone 130 queries the LED display system 140 for LED display system attributes, an input indicative of a current LED display specification data 401, a current LED battery power data 402, and a current LED minimum velocity data 403 that is stored locally in the memory unit 143 of the LED display system 140 is transmitted to the smartphone 130 through the wireless connection 106 from the wireless transceiver 142 of the LED display system 140 to the wireless transceiver 134 of the smartphone 130. Then, the smartphone 130 relays the input indicative of the current LED display specification data 401, the current LED battery power data 402, and the current LED minimum velocity data 403 to the central server 150 through wireless connection 105 from the wireless transceiver 134 of the smartphone 130 to the network transceiver 105, then to the wireless transceiver 170 of the central server 150.

[0045] Figure 5 is a flowchart 500 illustrating an embodiment of a process for storing an input data from an advertiser computing device. In the present embodiment, the input data includes an advertiser identifier data, comprising a username data, a password data, and a banking account data. The input is transmitted from the smartphone from the wireless transceiver of the smartphone to the network transceiver, then relayed to the wireless transceiver of the central server. The central server stores all received data to the data storage unit in the accounts database.

[0046] Figure 6 is a flowchart 600 illustrating an embodiment of a process for storing an input data from an input data from a smartphone. In the present embodiment, the input data includes: 1) an user identifier data, comprising username data, a password data, and a banking account data, and 2) a home location data. The input is transmitted from the smartphone from the wireless transceiver of the smartphone to the network transceiver, then relayed to the wireless transceiver of the central server. The central server stores all received data to the data storage unit in the accounts database.

[0047] In one embodiment, when there is multiple advertiser display group files, but no input data indicative of current GPS location data transmitted from a smartphone at a certain time, the central server compares the home location data to the location center point data of the multiple advertiser group files (see discussion of Figure 9). If the home location data is within a certain pre-determined distance from the location center point data of an advertiser group file, an alert message is sent to the smartphone from which the home location data originated.

[0048] Figure 7 is a flowchart 700 illustrating an embodiment of a process for storing an input data from an advertiser computing device. In the present embodiment, the

input data includes: 1) a display image data, 2) a time interval data, including a start time data and an end time data, 3) a location center point data, 4) a location radius data, 5) a display specification data, 6) a maximum price data, 7) a maximum instances data, and 8) budget data. The input is transmitted from the smartphone from the wireless transceiver of the smartphone to the network transceiver, then relayed to the wireless transceiver of the central server. The central server stores all received data to the data storage unit in the corresponding advertiser display group file in the live advertisement database.

[0049] Figure 8 is a flowchart 800 illustrating an embodiment of a process for facilitating data communication to and from communication devices executed by the system 100. At first step 802, a smartphone requests connection to a server by sending a wireless signal from a wireless transceiver of a smartphone to a network transceiver, then relayed to a wireless transceiver of a central server. When the smartphone transmits a wireless signal to the central server for connection, but no input is received, the process proceeds to step 803. At step 803, the smartphone updates a value of zero as an output indicative of current server connection data. The value of zero is reflected on the user interface as a connection lost with server error message. At step 804, the smartphone receives an acknowledgement signal from the server from a network transceiver to a wireless transceiver of a smartphone. At step 806, the smartphone transmits an output indicative of a current server connection data to the central server (see discussion of Figure 13). In the present embodiment, the output indicative of a current server connection data is at first stored locally in the memory unit of the smartphone (see discussion of Figure 3), transmitted from the wireless transceiver of the smartphone to the network transceiver, then relayed from the network transceiver to the wireless transceiver of the central server. In the

present embodiment, the user interface is updated to reflect the output indicative of the current server connection data (see discussion of Figure 15). The process repeats step 806 while in connection with the central server. In the present embodiment, the process repeats step 806 every second. At step 808, the smartphone receives a connection request from a LED display system by a wireless signal from a wireless transceiver of a LED display system to the wireless transceiver of a smartphone. Upon the initiation of a wireless connection between the LED display system and the smartphone, the smartphone converts the measure of data transfer integrity as an output indicative of current LED connection data (see discussion of Figure 13).

[0050] At step 810, the smartphone queries the LED display system for LED display system attributes. In the present embodiment, the LED display system attributes are stored in a memory unit of a LED display system and include a current LED display specification data, a current LED battery power data, and a current LED minimum velocity data. When the smartphone queries the LED display system for LED display system attributes, but no input is received, the process proceeds to step 812. At step 812, the smartphone transmits a value of zero as an output indicative of current LED connection data through the wireless connection from the wireless transceiver of the smartphone to the network transceiver. The current LED connection data is then relayed to the wireless transceiver of the central server. At step 814, the value of zero is reflected on the user interface as a connection lost with LED display system error message. When the smartphone queries the LED display system for LED display system attributes and an input indicative of a current LED display specification data, a current LED battery power data, and a current LED minimum velocity data is received at step 816, the smartphone transmits

an output indicative of current LED display system specification data to the central server at step 818 through the wireless connection from the wireless transceiver of the smartphone to the network transceiver, then relayed to the wireless transceiver of the central server. In the present embodiment, the user interface is updated to reflect the output indicative of the output indicative of the current LED display system specification data (see discussion of Figure 15). At step 820, the smartphone receives an input data indicative of current LED battery power data from the LED display system through the wireless connection from the wireless transceiver of the LED display system to the wireless transceiver of the smartphone. At step 822, the smartphone transmits an output indicative of current LED connection data to the central server through the wireless connection from the wireless transceiver of the smartphone to the network transceiver, then relayed to the wireless transceiver of the central server. In step 824, if the input indicative of current LED battery power data from the LED display system is zero in value, the smartphone transmits a value of zero as an output indicative of the current LED battery power data to the central server at step 826. At step 828, the value of zero is reflected on the user interface as an out of power error message. At step 830, if the current LED battery power data from the LED display system is not zero in value, then the smartphone transmits an output indicative of the current LED battery power data to the central server at step 830. At step 832, the output indicative of the current LED battery power data is reflected on the user interface (see discussion of Figure 15). When the process reaches step 832, the process repeats steps 820 to 832. In the present embodiment, the steps 820 to 832 repeats every second. At step 834, the smartphone transmits an output indicative of the current GPS location data from the wireless transceiver of the smartphone to the network transceiver, then relayed to the

wireless transceiver of the central server. The current GPS location data originated form the GPS satellite to the GPS of a smartphone, then stored at the memory unit of the smartphone as a current GPS location data (see discussion of Figures 1 and 3). The process repeats step 834. In the present embodiment, step 834 is repeated every second. The smartphone is then ready to receive output data indicative of advertiser image data from the advertiser display group file at the data storage unit of the central server at step 836.

[0051] Figure 9 is a flowchart of 900 illustrating an embodiment of a process for selecting an advertiser display group file to be sent to the auction process unit of the central server. At step 905, the central server receives an input data indicative of the current GPS location data from a smartphone through a wireless communication from the transceiver of the smartphone to a network transceiver, then relayed to the wireless transceiver of the central server. The current GPS location data originated form the GPS satellite to the GPS of a smartphone, then stored at the memory unit of the smartphone as a current GPS location data (see discussion of Figures 1 and 3). At step 910, upon the input data indicative of the current GPS location data being received at the wireless transceiver of the central server, the internal clock of the central server records the time the input data indicative of the current GPS location was received as a current time data. At step 915, the central server stores the current GPS location data as an archived GPS location data and the current time data as an archived time data in the accounts database.

[0052] At step 920, upon the input data indicative of the current GPS location data being received at the wireless transceiver of the central server, the central server queries the data storage unit for all advertiser display group file(s) in the live advertisement database at the storage unit. If no advertiser display group file is stored in the live

advertisement database at the storage unit, the server does not transmit a display image data and the smartphone does not receive a display image data from the central server at step 925. In the present embodiment at step 930, the LED display system is shut off after thirty seconds of no display image data transmission from the smartphone to the LED display system. If upon the central server's query of the data storage unit for all advertiser display group file(s) in the live advertisement database there is one or more advertiser display group file(s), three input data from the smartphone is compared to three constraints variables in each and every advertiser display group file in the live advertisement database at the data storage unit in steps 935, 940, and 945.

[0053] First in step 935, the input data from the smartphone indicative of current time data is compared to a time interval data, which includes a start time data and an end time data, from the advertiser display group file. If the current time data is not between the start time data and the end time data of time interval data from the advertiser display group file, the process proceeds to step 950 and the advertiser group file in question is not sent to the auction processing unit. If the current time data is between the start time data and the end time data, the process proceeds to step 940.

[0054] At step 940, the input data from the smartphone indicative of current GPS location data is compared to a location center point data from the advertiser display group file. If the distance between the current GPS location data to a location center point data from the advertiser display group file is greater than a location radius data from the advertiser display group file, the process proceeds to step 950 and the advertiser group file in question is not sent to the auction processing unit. If the distance between the current GPS location data to a location center point data from the advertiser display group file is

less than or equal to a location radius data from the advertiser display group file, the process proceeds to step 945.

[0055] At step 945, the current LED display system specification data from the smartphone is compared to a display specification data from the advertiser display group file. If the current LED display system specification data does not meet display specification data from the advertiser display group file, then the process proceeds to step 950 and the advertiser group file in question is not sent to the auction processing unit. If the current LED display system specification data does meet display specification data from the advertiser display group file, the central server determines whether there is only one advertiser display group file or more than one advertiser group files in the live advertisement database at the data storage unit. If there is only one advertiser display group file at step 955, the central server directly transmits display image data from the one advertiser display group file to the smartphone, bypassing the auction processing unit. If there is more than one advertiser display group files, the advertiser group file in question is sent to the auction processing unit in step 960.

[0056] In one embodiment, at step 945, there is only one advertiser display group file, the display image data from the advertiser display group file is transmitted to the smartphone. The budget data in the advertiser display group file is subtracted by a pre-determined operational parameter of base price per advertisement. For example, if the pre-determined operation parameter of base price is set to $1.00, the budget data in the advertiser display group file is subtracted by value indicative of $1.00.

[0057] In another embodiment, at step 960, there are more than one advertiser group files to be sent to the auction processing unit, the central server compares all

advertiser group files in the live advertisement database to calculate highest possible earnings data possible, given the plurality of constraints variables of the advertiser display group files. An output indicative of route suggestion is transmitted to the smartphone from which the input ata indicative of current GPS location data originated.

[0058] Figure 10 is a flowchart of 1000 illustrating an embodiment of a process for selecting an advertiser display group file and a smartphone at the auction process unit of the central server. The processes at the auction process unit is governed by the pre-determined operational parameters. At step 1005, the auction processing unit at the central server determines advertiser display group file with the highest maximum price data among the pool of advertiser display group files sent to the auction processing unit from steps 935 to 960. At step 1010, the auction processing unit at the central server determines the advertiser display group file with the second highest maximum price data among the same pool of advertiser display group files sent to the auction processing unit from steps 935 to 960. At step 1015, the central server queries the data storage unit to determine whether there are more than one smartphone transmitting current time data to the server.

[0059] If there is only one smartphone transmitting the current time data to the central server, the process proceeds to step 1020. At step 1020, the auction processing unit at the central server retrieves the display image data in the advertiser display group file with highest maximum price data. The wireless transceiver of the central server transmits the display image data to the network transceiver. The display image data is then relayed from the network transceiver to the wireless transceiver of the smartphone. At step 1022, the central server receives a completion signal from the smartphone, indicating the completion of image display data transmittance from the central server to the smartphone,

then relayed to the LED display system (see discussion of Figures 11 and 13). In the present embodiment at step 1025, upon receiving a completion signal from the smartphone indicating the completion of image display data transmittance, the central server deducts second highest maximum price and ten cents from the budget data in the advertiser display group file with the highest maximum price data. Then at step 1030, the central server adds a value indicative of one count to the advertisement count data in the accounts database. Then at step 1032, the central server adds a value indicative of earnings to the earnings data in the user account file in the accounts database.

[0060] At step 1015, if there is more than one smartphone transmitting the current time data to the central server, the process proceeds to step 1035. At step 1035, the auction processing unit generates a list of smartphones. In the present embodiment, the smartphones are sorted by the earliest current time data received. At step 1040, the auction processing unit at the central server retrieves the display image data in the advertiser display group file with highest maximum price data. The wireless transceiver of the central server transmits the display image data to the network transceiver. The display image data is then relayed from the network transceiver to the wireless transceiver of the smartphone in the order of the generated list in step 1035. At step 1042, the central server receives a completion signal from the smartphone, indicating the completion of image display data transmittance from the central server to the smartphone, then relayed to the LED display system (see discussion of Figures 11 and 13). In the present embodiment at step 1045, upon receiving a completion signal from the smartphone indicating the completion of image display data transmittance, the central server deducts second highest maximum price and ten cents from the budget data in the advertiser display group file with the highest

maximum price data. Then at step 1050, the central server adds a value indicative of one count to the advertisement count data in the accounts database. Then at step 1152, the central server adds a value indicative of earnings to the earnings data in the user account file in the accounts database. At step 1055, the steps 1040 to 1050 repeats until either the maximum instance data is equal to the advertisement count data in the accounts database, or the budget data is less than the second highest maximum price and ten cents, or the generated list of smartphones is exhausted.

[0061] In another embodiment, the generated list of smartphones is sorted by the IP address.

[0062] Figure 11 is a flowchart 1100 illustrating an embodiment of a process for communication between the central server and the smartphone to ensure that the minimum velocity required for the display image data to be displayed on LED display has been met. In the present embodiment, the processes at the central server is governed by the pre-determined operational parameters. At step 1105, the central server transmits a display image data from an advertiser display group file to a smartphone to be displayed on a LED display. At step 1110, the server queries an archived GPS location data for the two most recent GPS location data entries received at one second interval. At step 1115, the server calculates the distance between the two most recent GPS location data entries. In the present embodiment, the distance between the two GPS location data entries is calculated using the haversine formula. At step 1120, the central server records the calculated distance as the current velocity data. At step 1125, the central server queries the smartphone for an output indicative of a LED minimum velocity data, which originates from the memory unit

of the LED display system and transmitted through the wireless transceiver of LED display system and wireless transceiver of the smartphone.

[0063] At step 1130, the central server compares the current velocity data and the output indicative of a LED minimum velocity data. If upon comparison between the current velocity data and the output indicative of a LED minimum velocity, the current velocity data is less than the LED minimum velocity data, the process proceeds to step 1140. At step 1140, the user interface of the smartphone reflects a speed alert message. In the present embodiment, the process repeats step 1140 every second.

[0064] In the present embodiment at step 1145, the central server determines whether the speed alert message, the connection lost error message, or the out of power error message (see discussion of Figure 8B) has been reflected on the user interface of the smartphone for more than 15 seconds in a 30-second cycle. If so, the process proceeds to step 1150 and the central server does not update the budget data in the advertiser display group file, the advertisement count data in the advertiser account file, and the earnings data in the user account file at the data storage unit.

[0065] If the speed alert and/or the error messages have been reflected on the user interface of the smartphone for less than or equal to 15 seconds in a 30-second cycle, the process proceeds to step 1152. At step 1152, the central server receives a completion signal from the smartphone, indicating the completion of image display data transmittance from the central server to the smartphone, then relayed to the LED display system (see discussion of Figures 11 and 13). Then, in the present embodiment at step 1155, upon receiving a completion signal from the smartphone indicating the completion of image display data transmittance, the central server deducts a value indicative of price determined at the

auction processing unit from the budget data in the advertiser display group file with the highest maximum price data. Then at step 1160, the central server adds a value indicative of one count to the advertisement count data in the advertiser account file in the accounts database. Then at step 1165, the central server adds a value indicative of earnings to the earnings data in the user account file in the accounts database. If at step 1130 upon comparison between the current velocity data and the output indicative of a LED minimum velocity, the current velocity data is greater than or equal to the LED minimum velocity data, the process bypasses steps 1140 to 1145 and proceeds directly to step 1155. In the present embodiment, the process repeats step 1110 to 1130 every second.

[0066] In another embodiment, the speed alert message is accompanied by a sound data that is transmitted from the central server to the smartphone through a wireless transceiver of the central server to the wireless transceiver of the smartphone, then relayed to the sound system of the smartphone.

[0067] Figure 12 is a flowchart 1200 illustrating an embodiment of a process for updating the live advertisement database at the data storage unit. In the present embodiment, the processes at the central server is governed by the pre-determined operational parameters. At step 1205, the central server queries data storage unit for all advertiser display group file(s) in live advertisement database. At step 1210, the central server compares the time in internal clock of the central server to an end time data of a time interval data in an advertiser display group file in the live advertisement database at the data storage unit. In the present embodiment, if at step 1210, the internal clock is twenty-nine seconds less than the end time data of the time interval data in the advertiser display group file in question, the process proceeds directly to step 1230. At step 1230, the server

archives the advertiser display group file in the archived advertisement database at the data storage unit. If at step 1210, the internal clock is thirty seconds or more prior to the end time data of the time interval data in the advertiser display group file in question, the process proceeds to step 1215. At step 1215, the central server queries the advertiser display group file for the budget data at the data storage unit. If the budget data is zero in value indicative of budget, the process proceeds directly to step 1230. If the budget data is greater than zero in value indicative of budget, the process proceeds to step 1220. At step 1220, the central server compares the maximum instances data in the advertiser display group file and the advertisement count data in the corresponding advertiser account file in the accounts database. If the maximum instances data in the advertiser display group file is greater than or equal to the advertisement count data in the corresponding advertiser account file in accounts database, the process proceeds directly to step 1230. If the maximum instances data in the advertiser display group file is less than the advertisement count data in the corresponding advertiser account file in accounts database, the process proceeds to step 1225. At step 1225, the server keeps the advertiser display group file in question in the live advertisement database. In the present embodiment, the steps 1210 to 1225 is repeated every 30 seconds.

[0068] Figure 13 is a flowchart 1300 illustrating an embodiment of a process for determining the measure of data transfer integrity that is converted as an output indicative of connection data in a receiving device (e.g., advertiser computing device 110, smartphone 130, or LED display system 140 of system 100) through a wireless connection (e.g., Bluetooth connection 106 or wireless connection 103, 104, or 105 of system 100). The data transfer is from a transmitting device (e.g., advertiser computing device 110, smartphone

130, or LED display system 140 of system 100). In the present embodiment, the receiving device is a smartphone. In the present embodiment, the wireless connection is a Bluetooth connection. In the present embodiment, the data transfer is from a LED display system. In the present embodiment, the output indicative of connection data is the current LED connection data of system 100 in Figure 3. In step 1305, data is received by a receiving device from a transmitting device over a Bluetooth connection. In step 1310, receiving device transmits an initial acknowledgement signal to the transmitting device. In step 1315, if data was received successfully, then process 1315 proceeds to step 1330. In step 1330, the receiving device transmits a completion signal. If data was not successfully received, then it is retransmitted from transmitting device and received by receiving device in step 1320. The process repeats step 1320 until data transmission is complete, proceeding to step 1325. In step 1325, a completion signal is sent from receiving device to transmitting device, indicating that retransmitted data was successfully received.

[0069] In step 1335, statistics are compiled for determination of measure of data transfer integrity. In present embodiment, the statistics include size of data transferred (e.g., kilobyte, megabyte, gigabyte, and the like) and the time taken for data transfer (e.g., milliseconds, seconds, minutes, and the like) calculated by the difference between the time at which point the completion signal was transmitted and the time at which point the initial acknowledgement signal was transmitted. In step 1340, the measure of data transfer integrity is determined. In present embodiment, the measure of data transfer integrity is taken by dividing size of data transferred by the time taken for data transfer. At step 1345, the measure of data transfer integrity is converted as an output indicative of connection

data. In the present embodiment, the output indicative of connection data is the current LED connection data of system 100 in Figure 3.

[0070] Figure 14 illustrates a user interface presented to a user at step 802 illustrated in flowchart 800 in another embodiment of the invention. The user interface 1400 is a touch-sensitive display and includes a Start button 1410 and a Setup button 1420.

[0071] The Start button 1410 is a visual representation of data representing a command for the process illustrated in flowchart 800 to proceed to step 802 and then to step 804. In operation, upon selection of the Start button 1410, the smartphone transmits input data indicative of the command for the process to proceed to step 800, at which the smartphone requests a connection to the server by sending a wireless signal from a wireless transceiver of a smartphone to a network transceiver, then relayed to a wireless transceiver of the central server. The Setup button 1420 is a visual representation of data representing a command for the process to proceed to step 806, then proceed to step 808 to 832 (see also, discussion of Figure 15). Upon selecting the Setup button 1420, the user interface changes from interface 1400 to interface 1500.

[0072] Figure 15 illustrates a user interface presented to a user at step 806 illustrated in flowchart 800 in another embodiment of the invention. The user interface 1500 is a touch-sensitive display and includes a LED display system module 1505, a central server module 1515, and an account module 1525. The user interface 1500 further includes Re-Link button 1510 for establishing a communication between the LED display system and the smartphone, a Re-Try button 1520 for establishing a communication between the central server and the smartphone, and an Edit button 1530 for establishing a communication between the user account file at the data storage unit in the central server

and the smartphone. More specifically, the Re-Link button 1510 is a visual representation of data representing a command for process illustrated in flowchart 800 to proceed to step 808, then to steps 810 to 832. Upon selecting the Re-Link button 1510, a wireless signal for connection request is transmitted from and/or received by the smartphone to/from the LED display system. Once a communication is established between the LED display system and the smartphone, the smartphone queries the LED display system for LED display system attributes. In the present embodiment, the LED display system attributes are stored in a memory unit of a LED display system and include a current LED display specification data and a current LED battery power data. Furthermore, the current server connection data and the current LED connection data are stored in a memory unit of a smartphone. In the present embodiment, the current LED display specification data, which includes the name of the display system and the display resolution (e.g., monochrome, color, animation, 16+ LEDs, 256+ LEDs, 376+ LEDs, and the like), the current LED battery power data, and current LED connection data are displayed in the LED display system module 1505 in the user interface 1500.

[0073] The Re-Try button 1520 is a visual representation of data representing a command for process illustrated in flowchart 800 to proceed to step 802, then to steps 804 to 806. Upon selecting the Re-Try button 1520, the smartphone requests connection to the central server by sending a wireless signal from a wireless transceiver of a smartphone to a network transceiver, then relayed to a wireless transceiver of a central server. Then, the smartphone receives an acknowledgement signal from the server from a network transceiver to a wireless transceiver of a smartphone. The smartphone transmits an output indicative of a current server connection data to the central server (see discussion of Figure

13). In the present embodiment, the output indicative of a current server connection data is at first stored locally in the memory unit of the smartphone (see discussion of Figure 3), transmitted from the wireless transceiver of the smartphone to the network transceiver, then relayed from the network transceiver to the wireless transceiver of the central server. In the present embodiment, the output indicative of the current server connection data is displayed in the central server module 1515 in the user interface 1500.

[0074] The Edit button 1530 is a visual representation of data representing a command for process illustrated in flowchart 600 to proceed to step 610, then step 620. In the present embodiment, upon selecting the Edit button 1530, the user interface is updated to an interface (not shown) where a user identifier data and an earnings data in the user account file can be recorded as an input. In the present embodiment, the output indicative of an earnings data is stored in the user account file at the data storage unit. The output indicative of the earnings data is displayed in the account module 1525 in the user interface 1500.

[0075] Figure 16 illustrates a user interface presented to a user at step 1130 illustrated in flowchart 1100 in another embodiment of the invention. The user interface 1100 is a touch-sensitive display and includes a history module 1605, a connection module 1610, a speed alert module 1615, and a Stop button 1620. In the present embodiment, an output indicative of an archived GPS location data, an archived time data, and an earnings data is stored in the user account file in the accounts database at the data storage unit. In addition, an advertisement count data is stored in an advertiser account file in the accounts database at the data storage unit. The output indicative of the archived GPS location data, the archived time data, and the earnings data is displayed in the history module 1605 in the

user interface 1130. The output indicative of the advertisement count data is displayed in the history module 1605 in the user interface 1130. The speed alert module 1615 displays a speed alert message when step 1140 is reached in flowchart 1110 in another embodiment of the invention. In the present embodiment, an output indicative of a current server connection data, a current LED connection data, and a current GPS location data is stored in the memory unit of the smartphone. The output indicative of a current server connection data, a current LED connection data, and a current GPS location is displayed in the connection module 1610. Upon selecting the Stop button 1620, the smartphone stops transmitting current GPS location data to the central server and the display image data to the LED display system.

[0076] Figure 17 illustrates a user interface presented to a user at step 814 illustrated in flowchart 800 in another embodiment of the invention. The user interface 1700 is a touch-sensitive display and includes an error module 1705. In the present embodiment, the error module is a connection lost error message. In an alternative embodiment, the error module can be an out of power error message displayed at step 828, a connection lost with server error message displayed at step 803, or an invalid account message.

[0077] In another embodiment, each button 1410 to 1420 at the user interface 1400, 1510 to 1530 at the user interface 1500, and 1615 to 1620 at the user interface 1600 may be represented in numbers, letters, images, symbols, equations, colors, shapes, or other figures and characters.

[0078] Figure 18 is an advertiser interface presented to an advertiser at step 710 illustrated in flowchart 700 in another embodiment of the invention. The user interface

1800 includes an upload display image box 1805 to input a display image data, a dropdown menu box 1810 to input time interval data, a select-enabled map 1815 to input a location center point data, a drag-enabled line 1820 to input a location radius data, a location zipcode text box 1821 to alternatively input a location center data, a location radius text box 1822 to alternatively input a location radius data, a display specification checkbox 1825 to input a display specification data, a maximum price text box 1830 to input a maximum price data, a maximum instances text box 1835 to input a maximum instances data, a budget text box 1840 to input a budget data, and a submit button 1845 to transmit the input data to the central server through a wireless communication.

[0079] Figure 19 is a map illustration 1900 of steps 1005 to 1055 illustrated in flowchart 1000 according to another embodiment of the invention. The map illustration 1900 includes a first location center point data 1905, a second location center point data 1910, a first circular geographic area 1915 defined by a first location radius data 1920, a second circular geographic area 1925 defined by a second location radius data 1930, a first current GPS location data 1935 transmitted from a first smartphone, and a second current GPS location data 1940 transmitted from a second smartphone.

[0080] In operation, at step 1005, the central server determines the advertiser display group file with highest maximum price data by comparing the maximum price data of first and second advertiser display group files. If the advertiser display group file with the center point data 1905 has higher maximum price data than the advertiser display group file with the center point data 1920, the display image data of the advertiser display group file with the center point data 1905 will be transmitted to a smartphone for display. Because in the present embodiment, there are two smartphones transmitting current GPS location

data, a list of the two smartphones will be generated, sorted by the earliest current time data received. The first smartphone with the first current GPS location data 1925 will be the first smartphone to receive the display image data of the advertiser display group file with the center point data 1905.

[0081] 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.

Your application is great so far!
↳ Not here - Best route
- "Push" during high revenue times

CLAIMS

1. A communication system for transmitting and receiving display image data based on location, said communication system comprising:

a smartphone including a GPS wherein said smartphone is in a wireless ~~connection~~ with a central server;

a LED display system including a light display wherein said LED display system ~~is~~ in a wireless connection with said smartphone;

an advertiser computing device wherein said advertiser computing device is in a wireless connection with said central server;

said central server including:

a data storage unit storing:

an advertiser display group file, wherein said advertiser display group file includes a display image data and constraints variables, wherein said constraints variables include a time interval data with a start time data and an end time data, a location center point data, and a location radius data;

an internal clock;

wherein said central server:

receives a current GPS location data from said smartphone,

records time said current GPS location data was received as a current time data;

~~associates~~ said advertiser display group file with said smartphone when said current time data transmitted from said smartphone is within said start time data and said end time data of said time interval data;

transmits said display image data of said advertiser display group file to said LED display system when a measure of distance between said current GPS location data to said location center point data is less than said location radius data.

2. The communication system of claim 1, wherein said LED display system is bicycle spokes LED lights.

3. The communication system of claim 1, wherein said display image data communicated between said smartphone and said LED display system includes a Bluetooth signal.

4. The communication system of claim 1, wherein said display image data is in JPEG format, PNG format, AVI format, or MOV format.

5. The communication system of claim 1, wherein said data storage unit includes a plurality of advertiser display group files.

6. The communication system of claim 1, wherein said system includes a plurality of smartphones.

7. A method for transmitting and receiving display image data based on location, said method comprising:

receiving a display image data and constraints variables, wherein said constraints variables include a time interval data with a start time data and an end time data, a location center point data, and a location radius data;

storing said display image data and said constraints variables;

receiving a current GPS location data of a smartphone;

recording time said current GPS location data was received as a current time data;

associating said display image data with said smartphone when said current time data transmitted from said smartphone is within said start time data and said end time data of said time interval data;

transmitting said display image data to said smartphone when a measure of distance between said current GPS location data to said location center point data is less than said location radius data.

8. The method of claim 7, further comprising transmitting said display image data from said smartphone to a LED display system, wherein said LED display system is in a wireless connection with said smartphone.

9. The method of claim 8, wherein said LED display system is bicycle spokes LED lights.

10. The method of claim 8, wherein said display image data communicated between said smartphone and said LED display system includes a Bluetooth signal.

11. The method of claim 8, wherein said display image data is in JPEG format, PNG format, AVI format, or MOV format.

12. A method of associating an advertiser display group file to a smartphone, said method comprising:

receiving a current GPS location data of a smartphone;

recording time said current GPS location data was received as a current time data;

querying a data storage unit for all advertiser display group file(s) in a live advertisement database, wherein each advertiser display group file includes a display image data and constraints variables, wherein said constraints variables include a time interval data with a start time data and an end time data, a location center point data, a location radius data, and a maximum price data;

transmitting one or more advertiser display group file(s) to an auction processing unit when said current time data transmitted from said smartphone is within said start time data and said end time data of said time interval data of said advertiser display group file, and when a measure of distance between said current GPS location data to said location center point data of said advertiser display group file is less than said location radius data of said advertiser display group file.

determining said advertiser display group file with highest said maximum price data from said auction processing unit;

associating said advertiser display group file with highest said maximum price data from said auction processing unit with said smartphone.

13. The method of claim 12, further comprising transmitting said display image data of said advertiser display group file with highest said maximum price data from said auction processing unit to said smartphone through a wireless connection.

14. The method of claim 13, further comprising transmitting said display image data from said smartphone to a LED display system, wherein said LED display system is in a wireless connection with said smartphone.

15. The method of claim 13, wherein said LED display system is bicycle spokes LED lights.

16. The method of claim 13, wherein said display image data communicated between said smartphone and said LED display system includes a Bluetooth signal.

17. The method of claim 13, wherein said display image data is in JPEG format, PNG format, AVI format, or MOV format.

ABSTRACT

A [method and/or system] is provided which [describe invention as claimed]

Figure 1

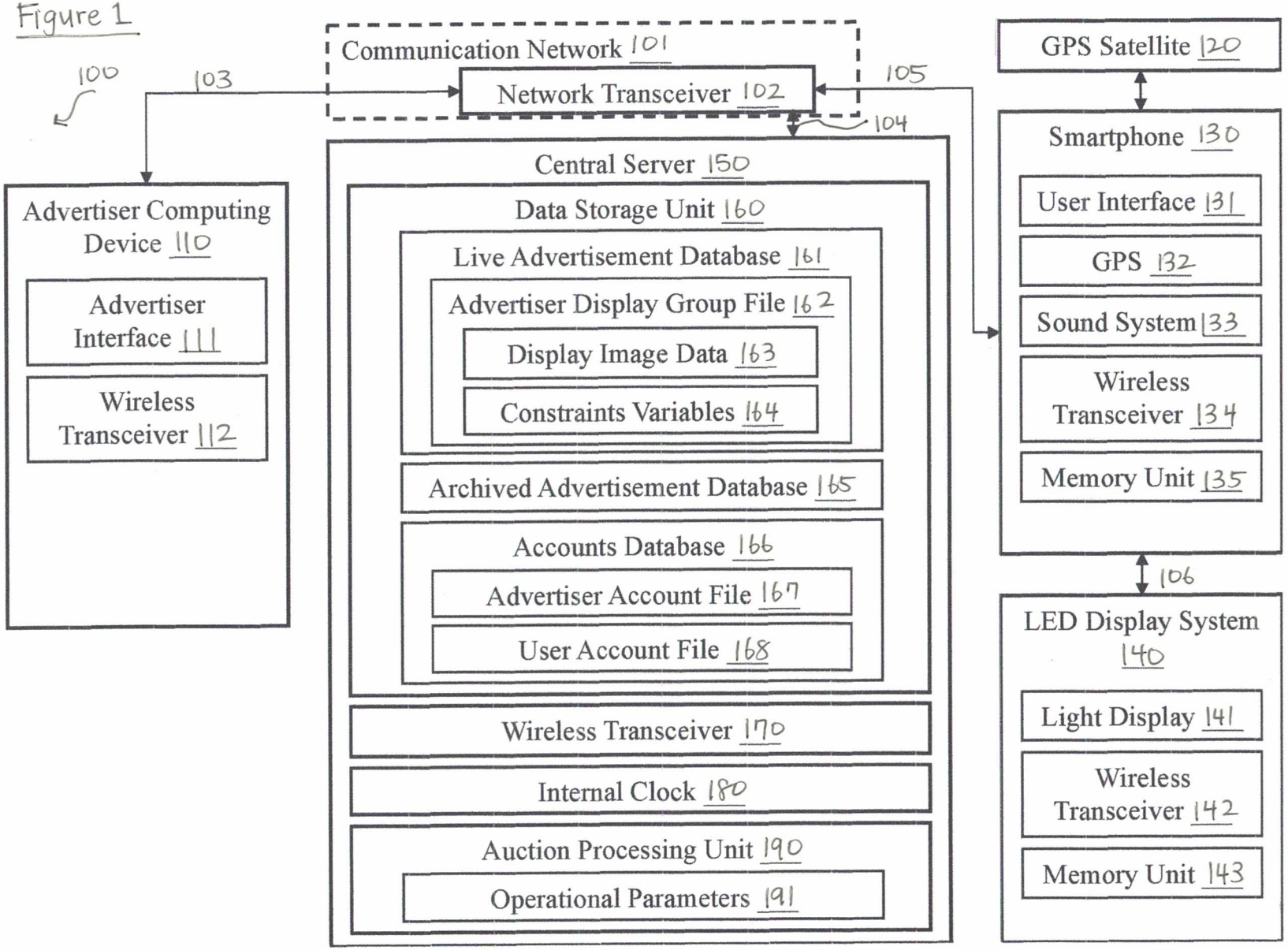
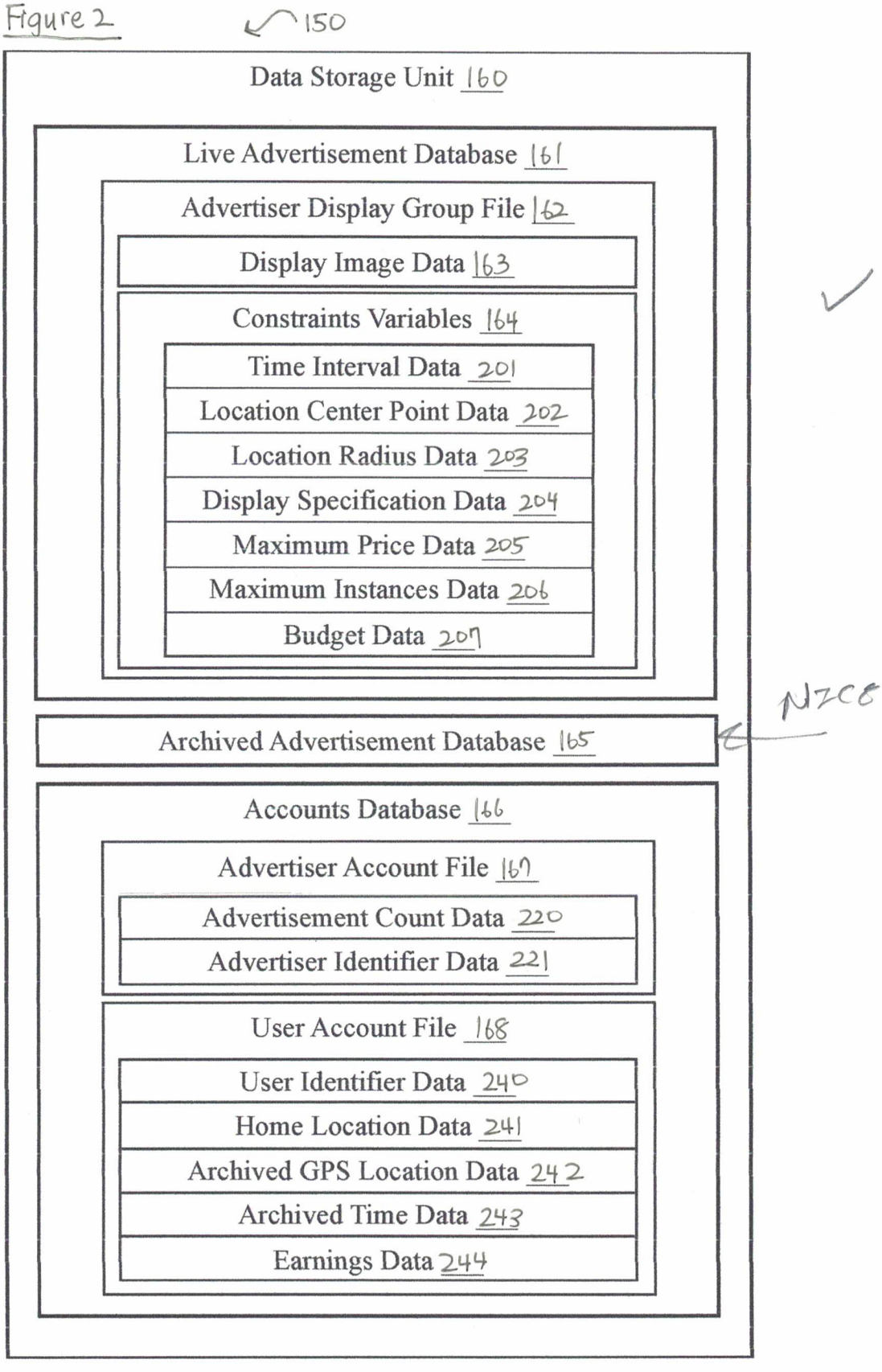

100
103
Communication Network 101
Network Transceiver 102
105
GPS Satellite 120
104
Smartphone 130
Central Server 150
Advertiser Computing Device 110
Advertiser Interface 111
Wireless Transceiver 112
Data Storage Unit 160
Live Advertisement Database 161
Advertiser Display Group File 162
Display Image Data 163
Constraints Variables 164
Archived Advertisement Database 165
Accounts Database 166
Advertiser Account File 167
User Account File 168
Wireless Transceiver 170
Internal Clock 180
Auction Processing Unit 190
Operational Parameters 191
User Interface 131
GPS 132
Sound System 133
Wireless Transceiver 134
Memory Unit 135
106
LED Display System 140
Light Display 141
Wireless Transceiver 142
Memory Unit 143

Figure 2


150
Data Storage Unit 160
Live Advertisement Database 161
Advertiser Display Group File 162
Display Image Data 163
Constraints Variables 164
Time Interval Data 201
Location Center Point Data 202
Location Radius Data 203
Display Specification Data 204
Maximum Price Data 205
Maximum Instances Data 206
Budget Data 207
Archived Advertisement Database 165
NZCE
Accounts Database 166
Advertiser Account File 167
Advertisement Count Data 220
Advertiser Identifier Data 221
User Account File 168
User Identifier Data 240
Home Location Data 241
Archived GPS Location Data 242
Archived Time Data 243
Earnings Data 244

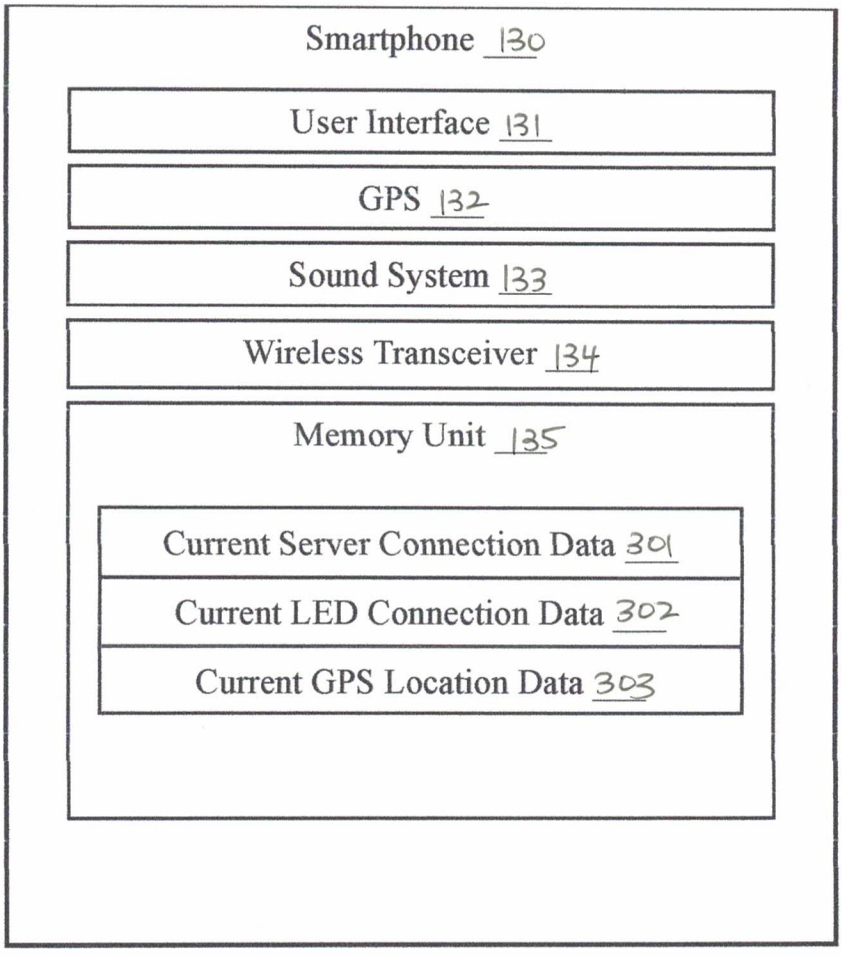

Smartphone 130
User Interface 131
GPS 132
Sound System 133
Wireless Transceiver 134
Memory Unit 135
Current Server Connection Data 301
Current LED Connection Data 302
Current GPS Location Data 303

Figure 3

100

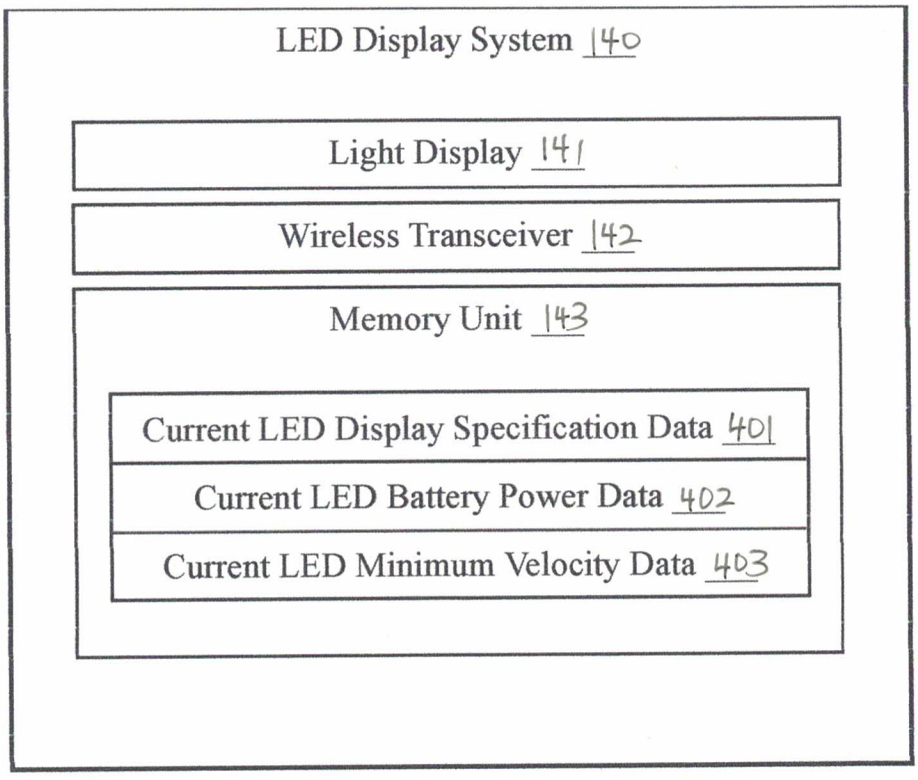

LED Display System 140
Light Display 141
Wireless Transceiver 142
Memory Unit 143
Current LED Display Specification Data 401
Current LED Battery Power Data 402
Current LED Minimum Velocity Data 403

Figure 4 ↙ 100

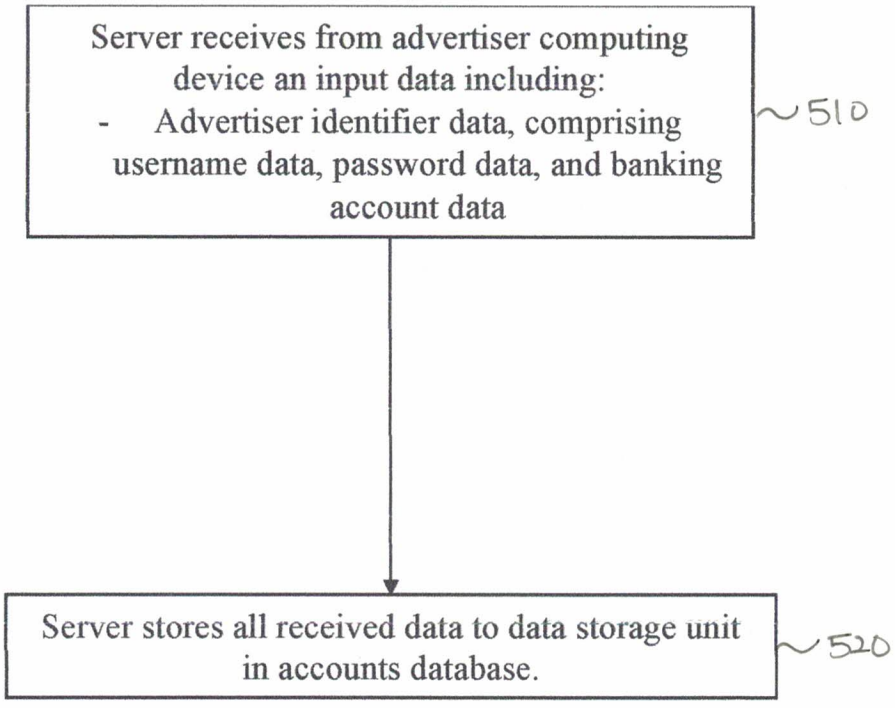

Server receives from advertiser computing device an input data including:
- Advertiser identifier data, comprising username data, password data, and banking account data
510
Server stores all received data to data storage unit in accounts database.
520

Figure 5

500

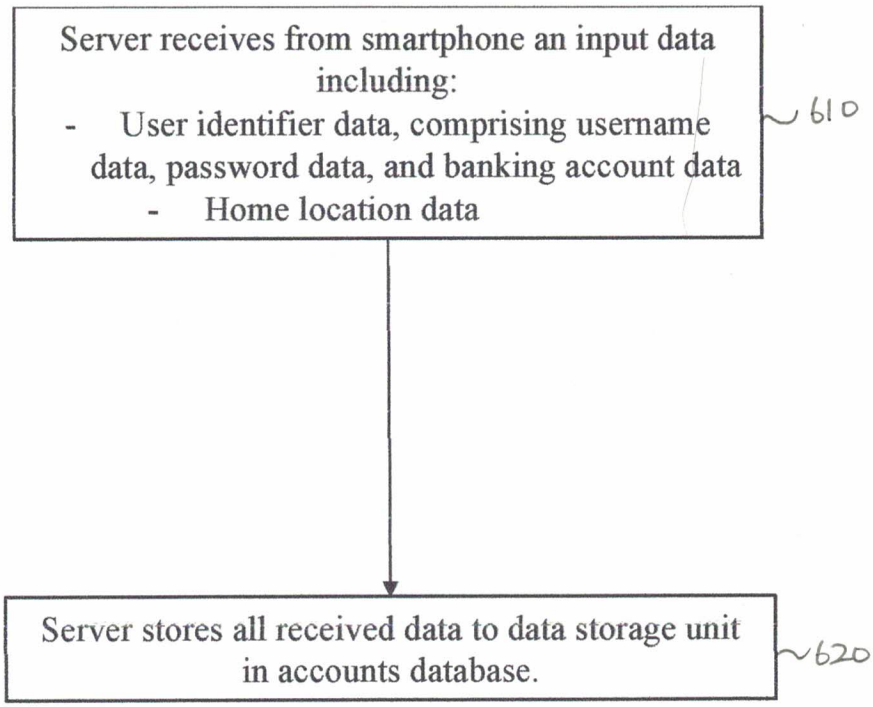

Server receives from smartphone an input data including:
- User identifier data, comprising username data, password data, and banking account data
- Home location data
610
Server stores all received data to data storage unit in accounts database.
620

Figure 6

600

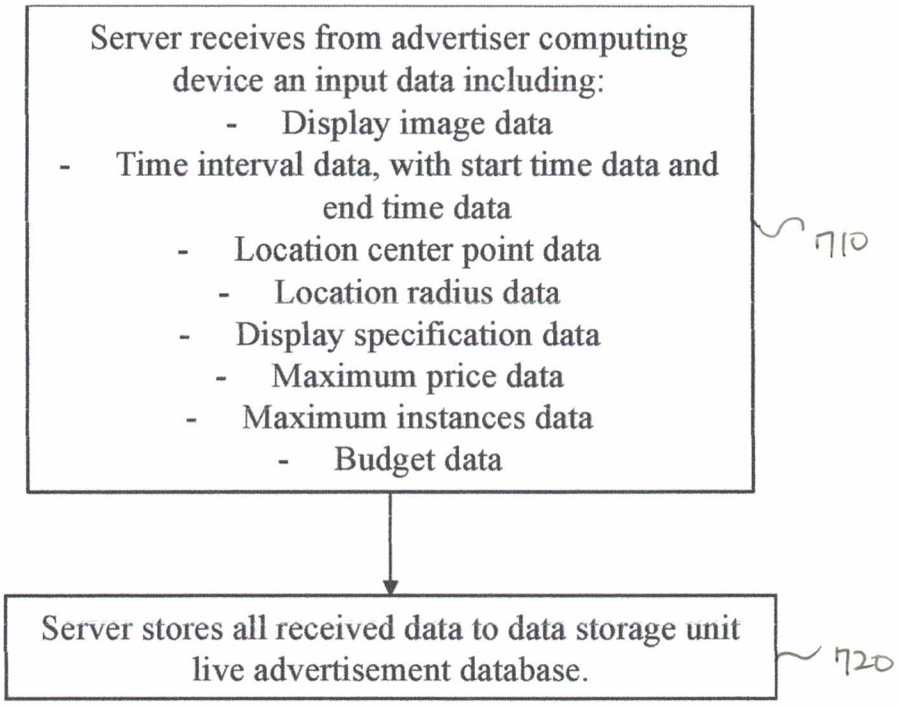

Server receives from advertiser computing device an input data including:
- Display image data
- Time interval data, with start time data and end time data
- Location center point data
- Location radius data
- Display specification data
- Maximum price data
- Maximum instances data
- Budget data
710
Server stores all received data to data storage unit live advertisement database.
720

Figure 7

700

Figure 8A

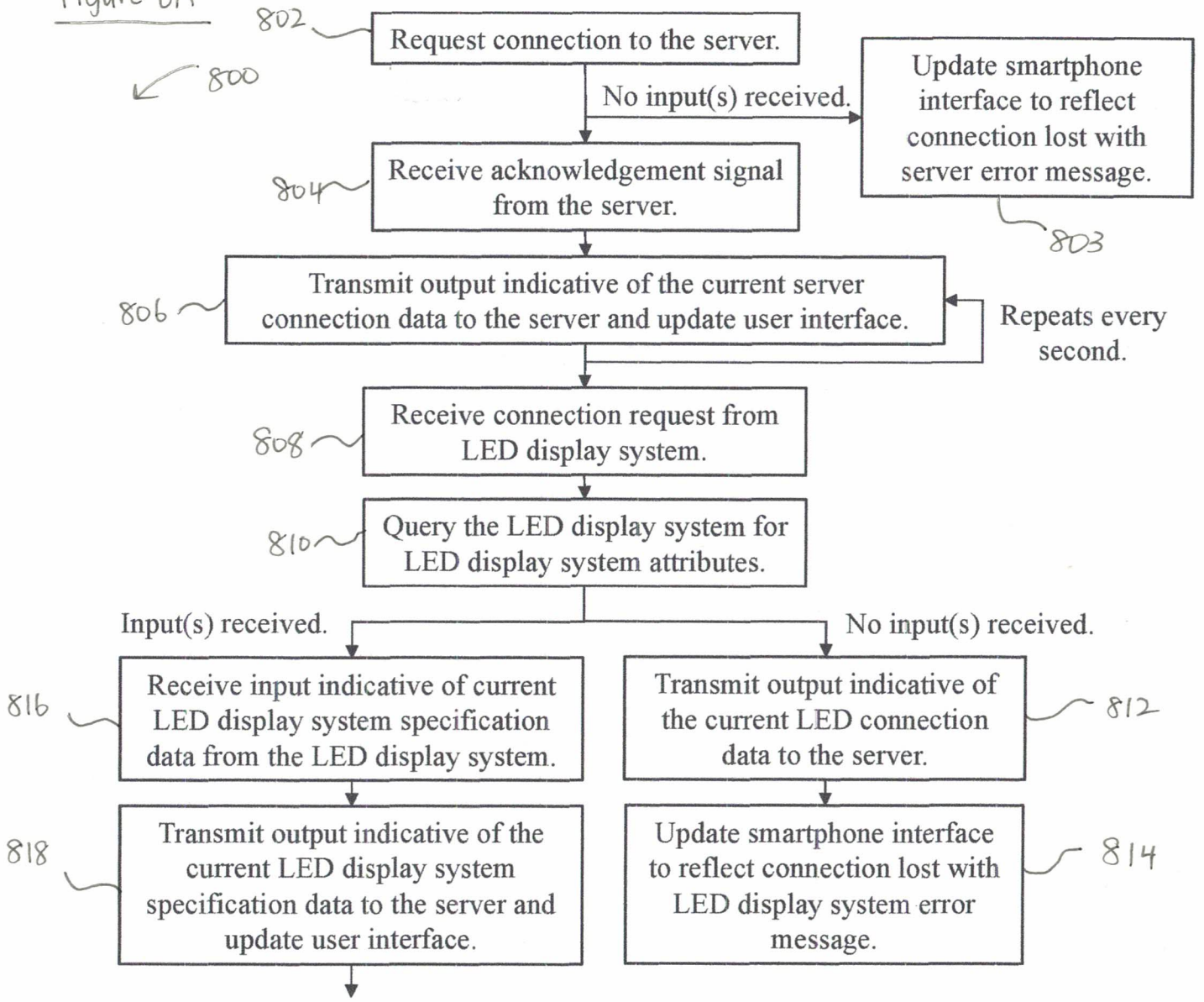

800
802
Request connection to the server.
No input(s) received.
Update smartphone interface to reflect connection lost with server error message.
803
804
Receive acknowledgement signal from the server.
806
Transmit output indicative of the current server connection data to the server and update user interface.
Repeats every second.
808
Receive connection request from LED display system.
810
Query the LED display system for LED display system attributes.
Input(s) received.
No input(s) received.
816
Receive input indicative of current LED display system specification data from the LED display system.
Transmit output indicative of the current LED connection data to the server.
812
818
Transmit output indicative of the current LED display system specification data to the server and update user interface.
Update smartphone interface to reflect connection lost with LED display system error message.
814

Figure 8B

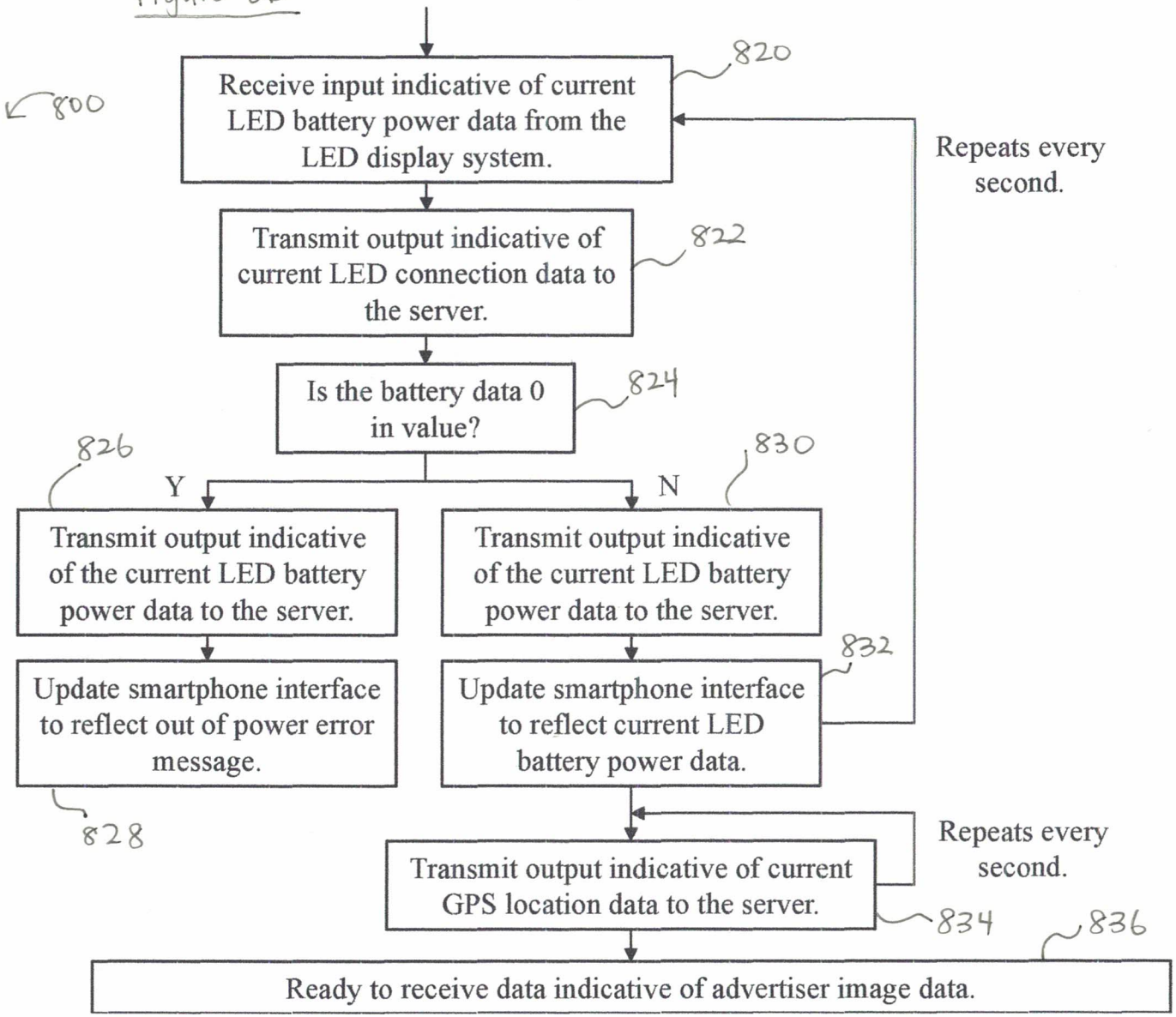

800
Receive input indicative of current LED battery power data from the LED display system.
820
Repeats every second.
Transmit output indicative of current LED connection data to the server.
822
Is the battery data 0 in value?
824
826
Y
N
830
Transmit output indicative of the current LED battery power data to the server.
Transmit output indicative of the current LED battery power data to the server.
832
Update smartphone interface to reflect out of power error message.
Update smartphone interface to reflect current LED battery power data.
828
Repeats every second.
Transmit output indicative of current GPS location data to the server.
834
836
Ready to receive data indicative of advertiser image data.

Figure 9

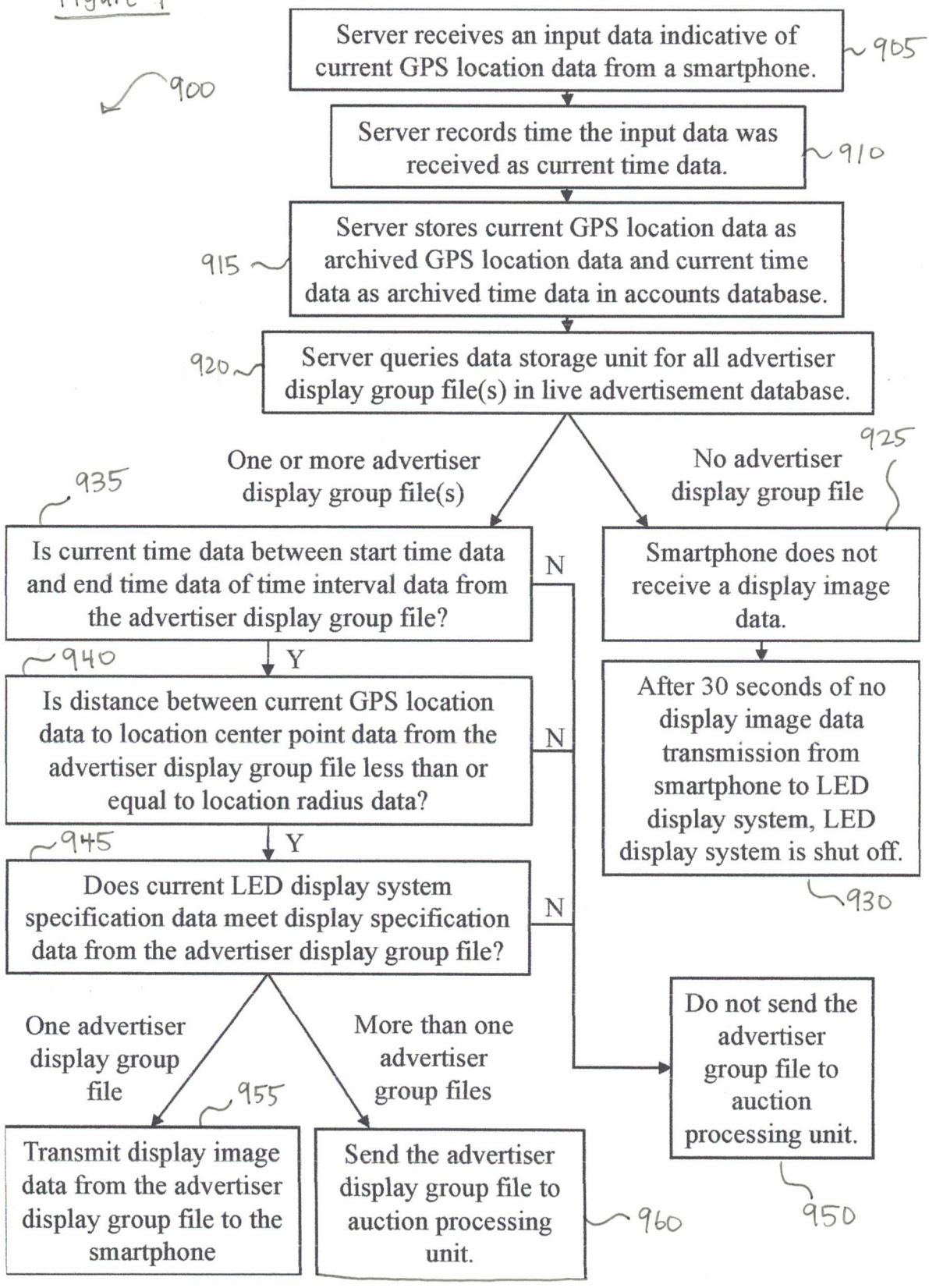

900
Server receives an input data indicative of current GPS location data from a smartphone.
905
Server records time the input data was received as current time data.
910
Server stores current GPS location data as archived GPS location data and current time data as archived time data in accounts database.
915
Server queries data storage unit for all advertiser display group file(s) in live advertisement database.
920
One or more advertiser display group file(s)
No advertiser display group file
925
935
Is current time data between start time data and end time data of time interval data from the advertiser display group file?
N
Y
940
Is distance between current GPS location data to location center point data from the advertiser display group file less than or equal to location radius data?
N
Y
945
Does current LED display system specification data meet display specification data from the advertiser display group file?
N
One advertiser display group file
More than one advertiser group files
955
Transmit display image data from the advertiser display group file to the smartphone
Send the advertiser display group file to auction processing unit.
960
Smartphone does not receive a display image data.
After 30 seconds of no display image data transmission from smartphone to LED display system, LED display system is shut off.
930
Do not send the advertiser group file to auction processing unit.
950

Figure 11

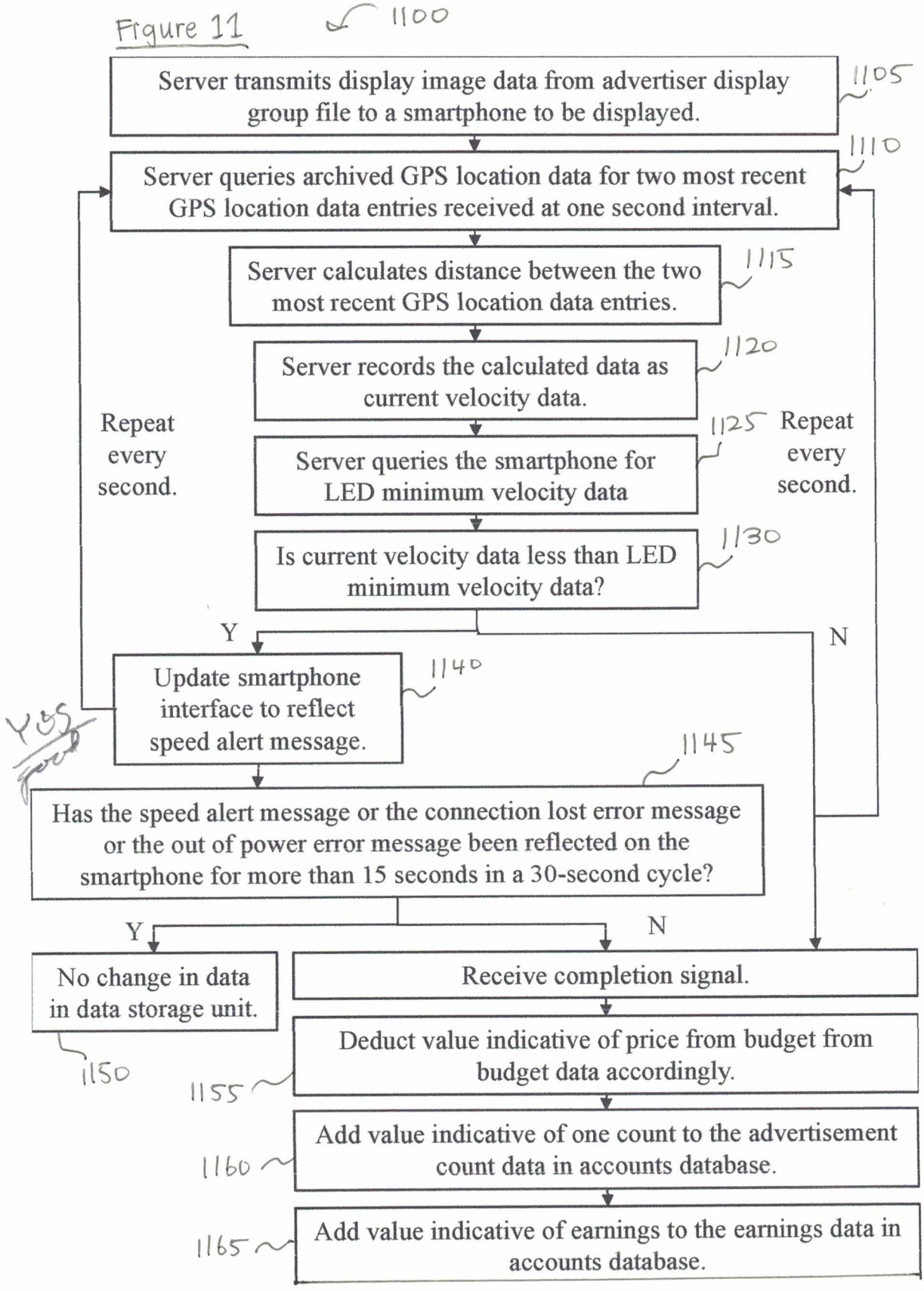

1100
Server transmits display image data from advertiser display group file to a smartphone to be displayed.
1105
Server queries archived GPS location data for two most recent GPS location data entries received at one second interval.
1110
Server calculates distance between the two most recent GPS location data entries.
1115
Server records the calculated data as current velocity data.
1120
Repeat every second.
Server queries the smartphone for LED minimum velocity data
1125
Repeat every second.
Is current velocity data less than LED minimum velocity data?
1130
Y
N
Update smartphone interface to reflect speed alert message.
1140
Yes
Has the speed alert message or the connection lost error message or the out of power error message been reflected on the smartphone for more than 15 seconds in a 30-second cycle?
1145
Y
N
No change in data in data storage unit.
1150
Receive completion signal.
Deduct value indicative of price from budget from budget data accordingly.
1155
Add value indicative of one count to the advertisement count data in accounts database.
1160
Add value indicative of earnings to the earnings data in accounts database.
1165

Figure 12

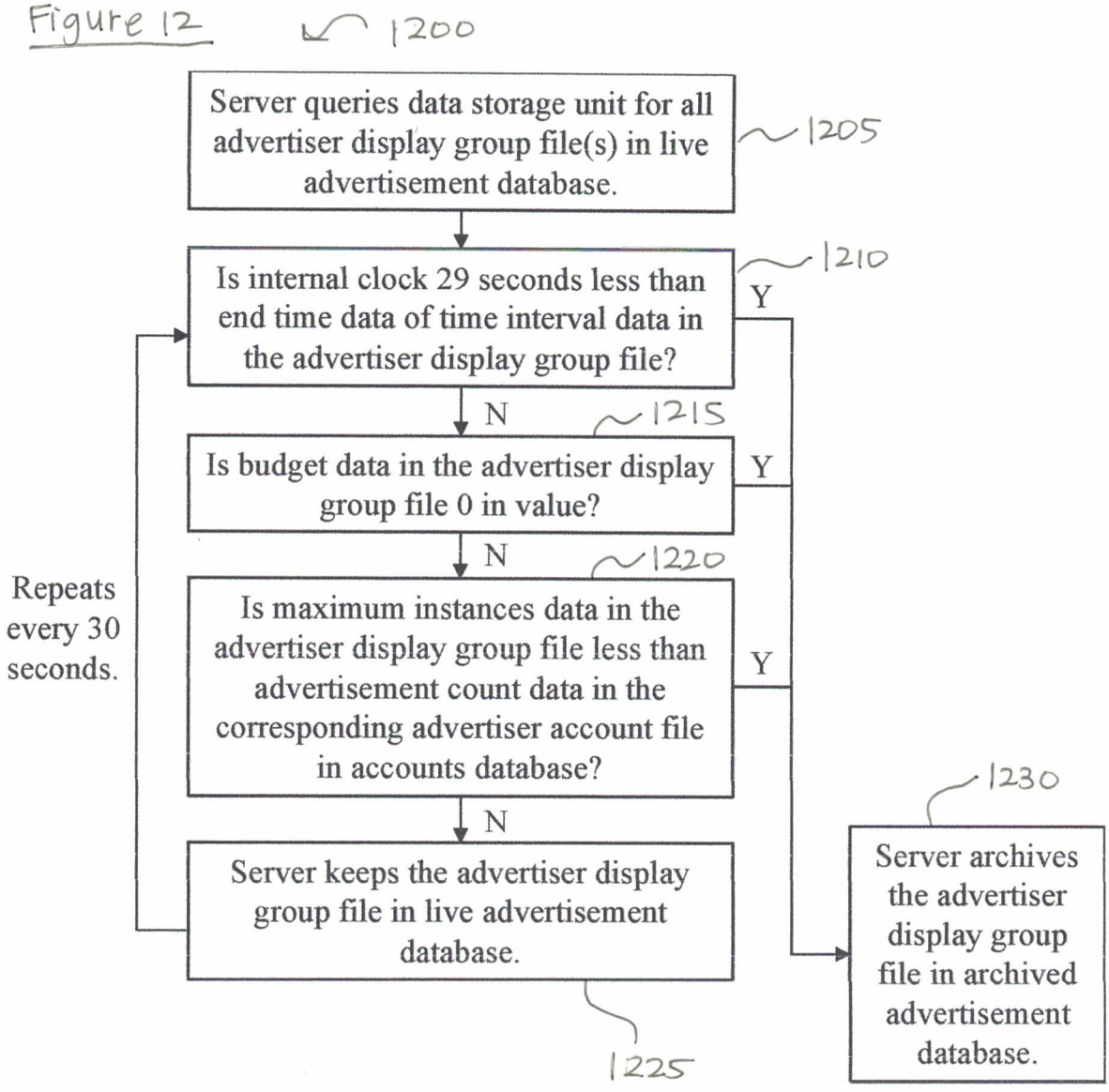

1200
Server queries data storage unit for all advertiser display group file(s) in live advertisement database.
1205
Is internal clock 29 seconds less than end time data of time interval data in the advertiser display group file?
1210
Y
N
Is budget data in the advertiser display group file 0 in value?
1215
Y
N
Is maximum instances data in the advertiser display group file less than advertisement count data in the corresponding advertiser account file in accounts database?
1220
Y
N
Server keeps the advertiser display group file in live advertisement database.
1225
Server archives the advertiser display group file in archived advertisement database.
1230
Repeats every 30 seconds.

Figure 13

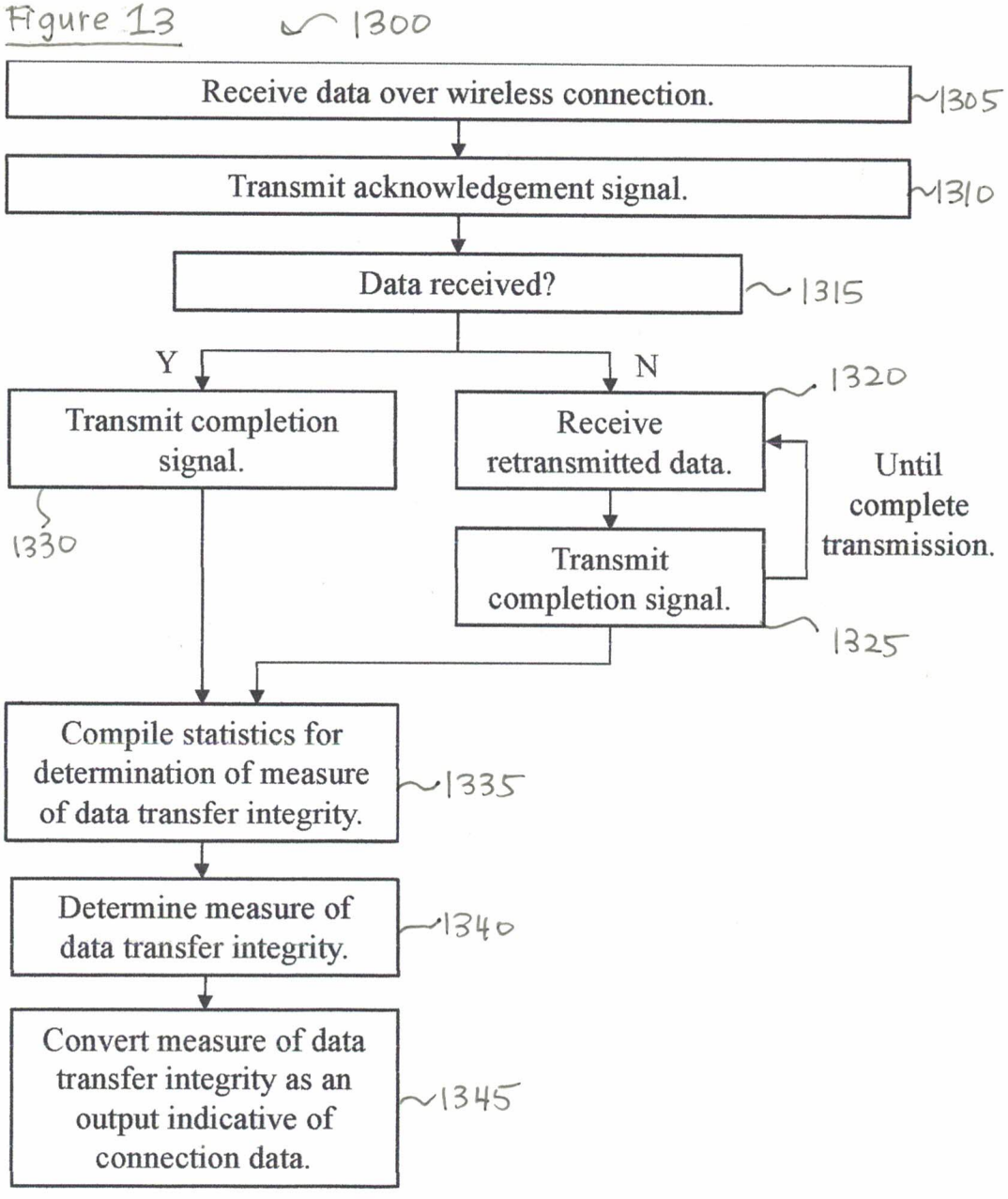

1300
Receive data over wireless connection.
1305
Transmit acknowledgement signal.
1310
Data received?
1315
Y
N
Transmit completion signal.
1330
Receive retransmitted data.
1320
Transmit completion signal.
1325
Until complete transmission.
Compile statistics for determination of measure of data transfer integrity.
1335
Determine measure of data transfer integrity.
1340
Convert measure of data transfer integrity as an output indicative of connection data.
1345

Figure 14

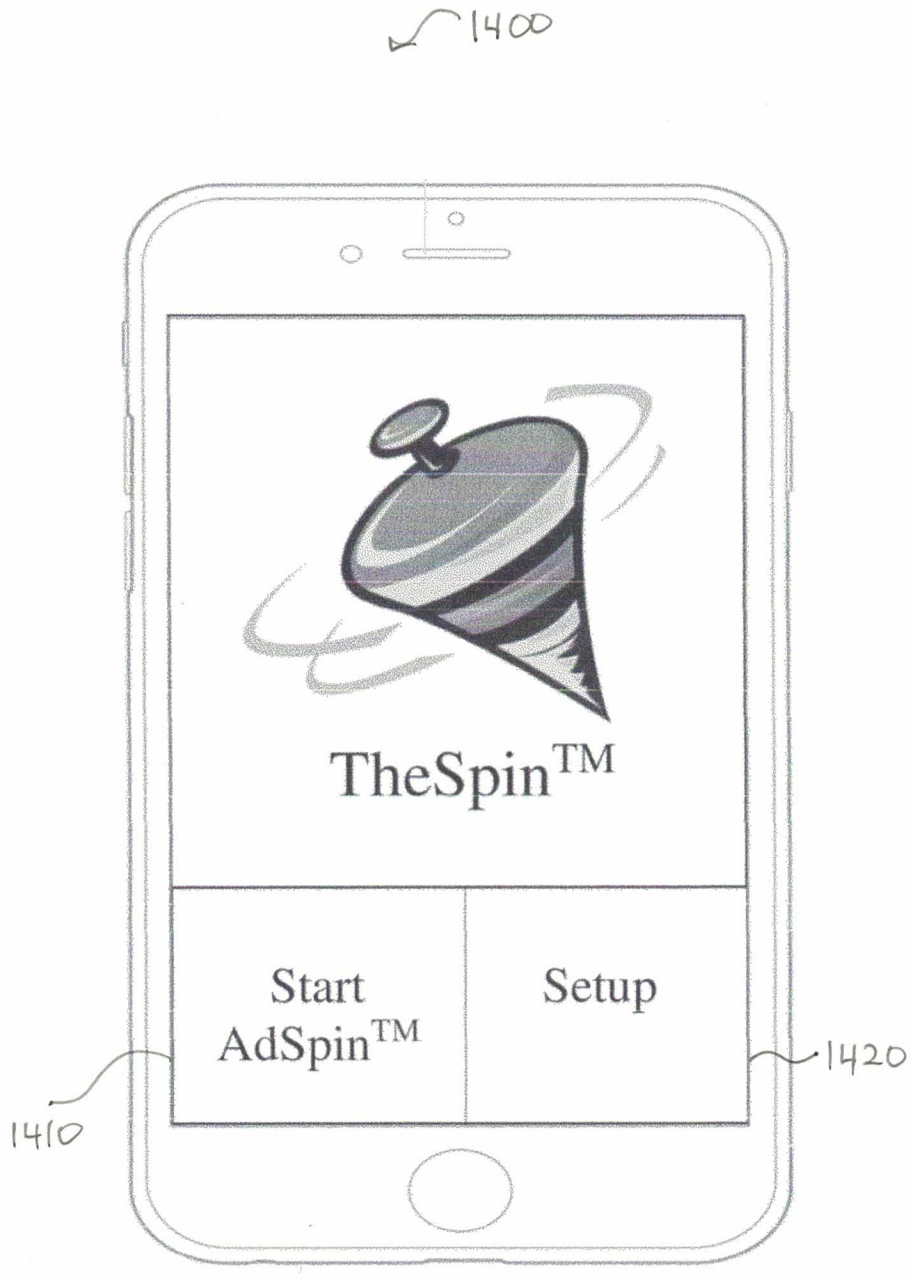


Figure 15

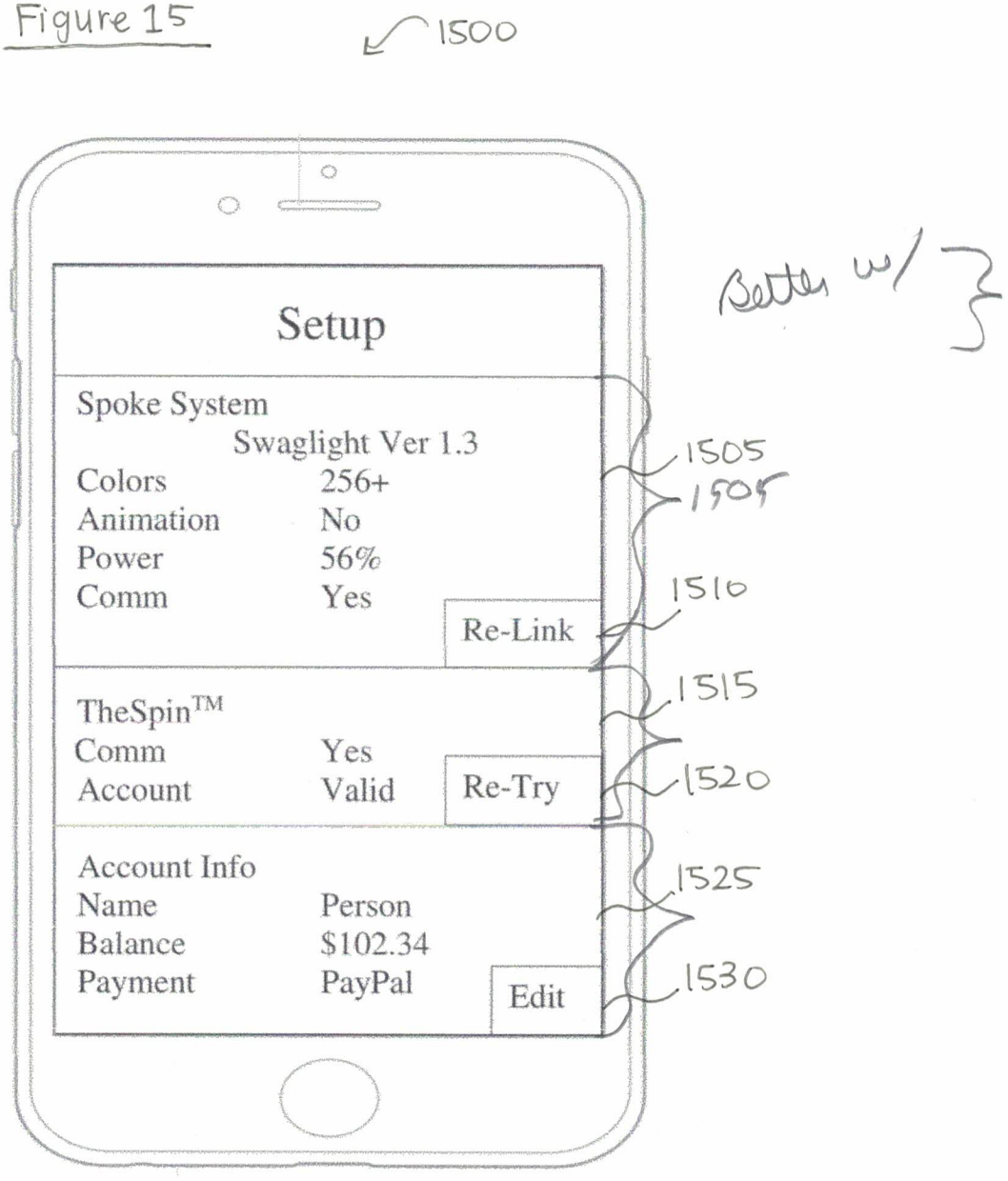

1500
Setup
Spoke System
Swaglight Ver 1.3
Colors 256+
Animation No
Power 56%
Comm Yes
Re-Link
TheSpin™
Comm Yes
Account Valid
Re-Try
Account Info
Name Person
Balance $102.34
Payment PayPal
Edit
Better w/ 3
1505
1505
1510
1515
1520
1525
1530

Figure 16

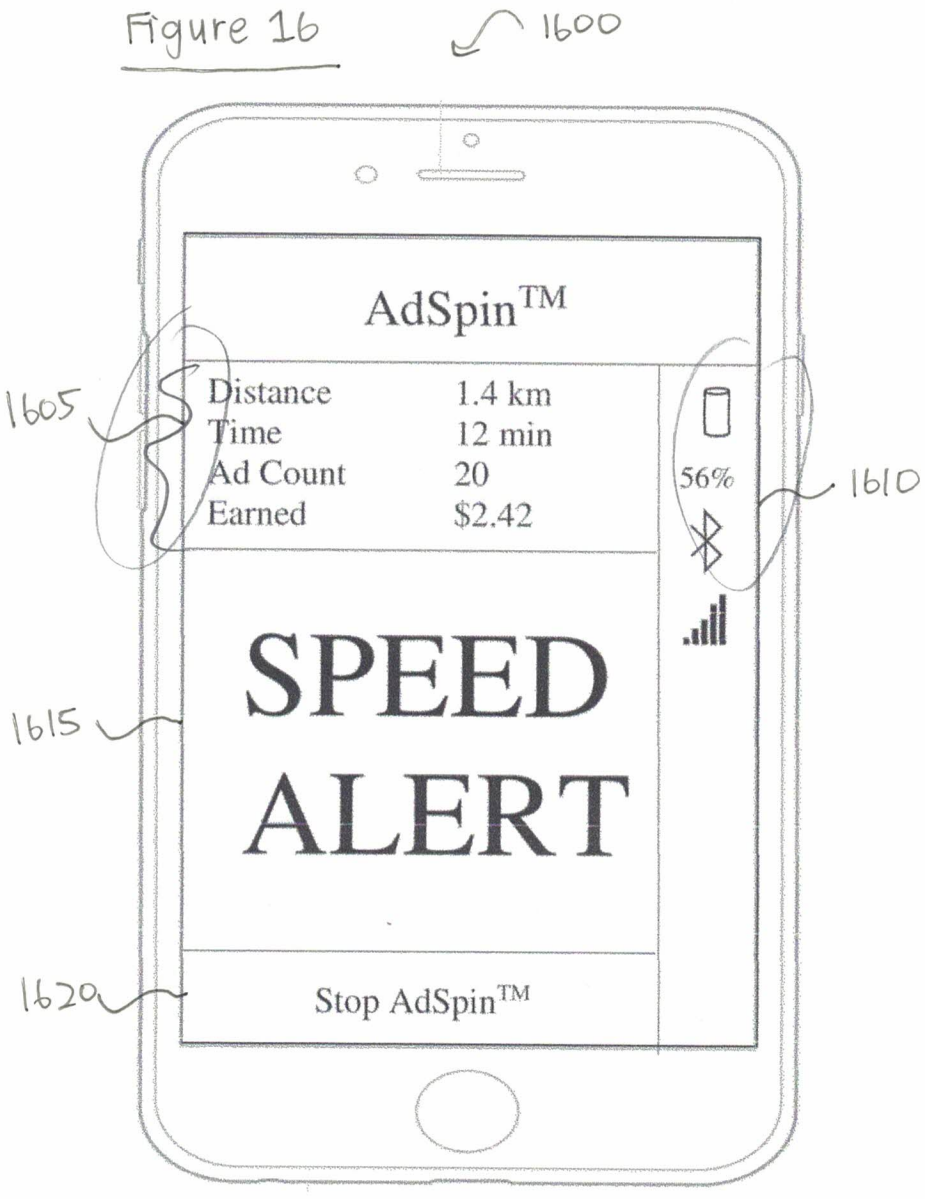

1600
AdSpin™
Distance 1.4 km
Time 12 min
Ad Count 20
Earned $2.42
56%
SPEED ALERT
Stop AdSpin™
1605
1610
1615
1620

Figure 17

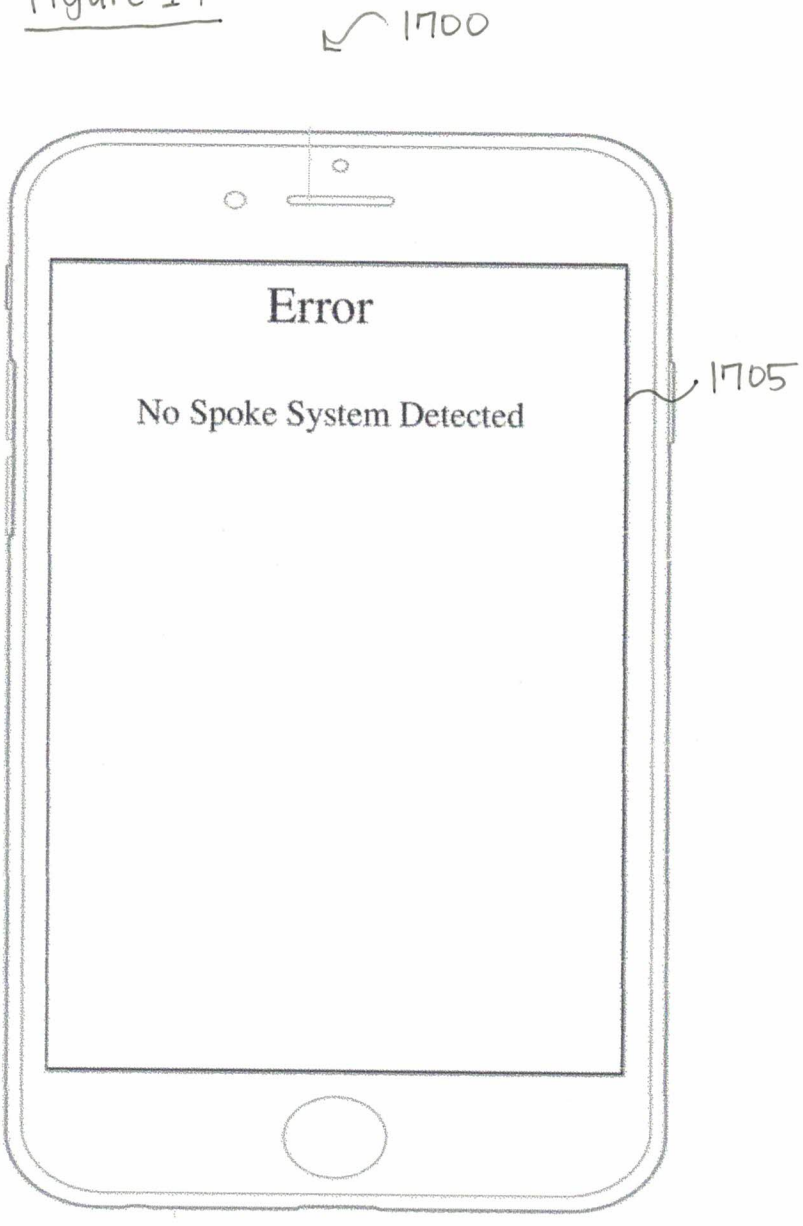
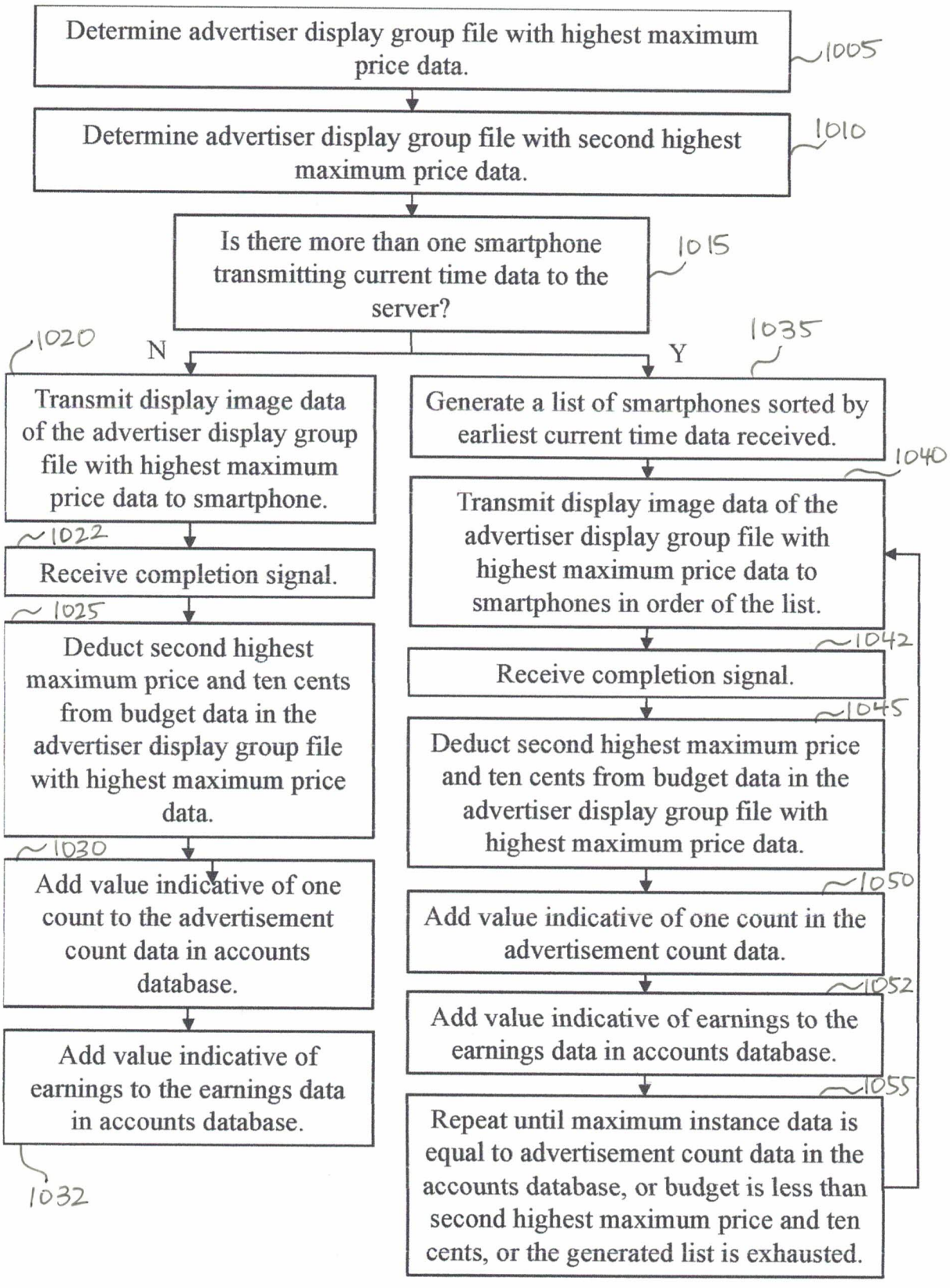


Figure 10


1000
Determine advertiser display group file with highest maximum price data.
1005
Determine advertiser display group file with second highest maximum price data.
1010
Is there more than one smartphone transmitting current time data to the server?
1015
N
Y
1020
Transmit display image data of the advertiser display group file with highest maximum price data to smartphone.
1022
Receive completion signal.
1025
Deduct second highest maximum price and ten cents from budget data in the advertiser display group file with highest maximum price data.
1030
Add value indicative of one count to the advertisement count data in accounts database.
Add value indicative of earnings to the earnings data in accounts database.
1032
1035
Generate a list of smartphones sorted by earliest current time data received.
1040
Transmit display image data of the advertiser display group file with highest maximum price data to smartphones in order of the list.
1042
Receive completion signal.
1045
Deduct second highest maximum price and ten cents from budget data in the advertiser display group file with highest maximum price data.
1050
Add value indicative of one count in the advertisement count data.
1052
Add value indicative of earnings to the earnings data in accounts database.
1055
Repeat until maximum instance data is equal to advertisement count data in the accounts database, or budget is less than second highest maximum price and ten cents, or the generated list is exhausted.

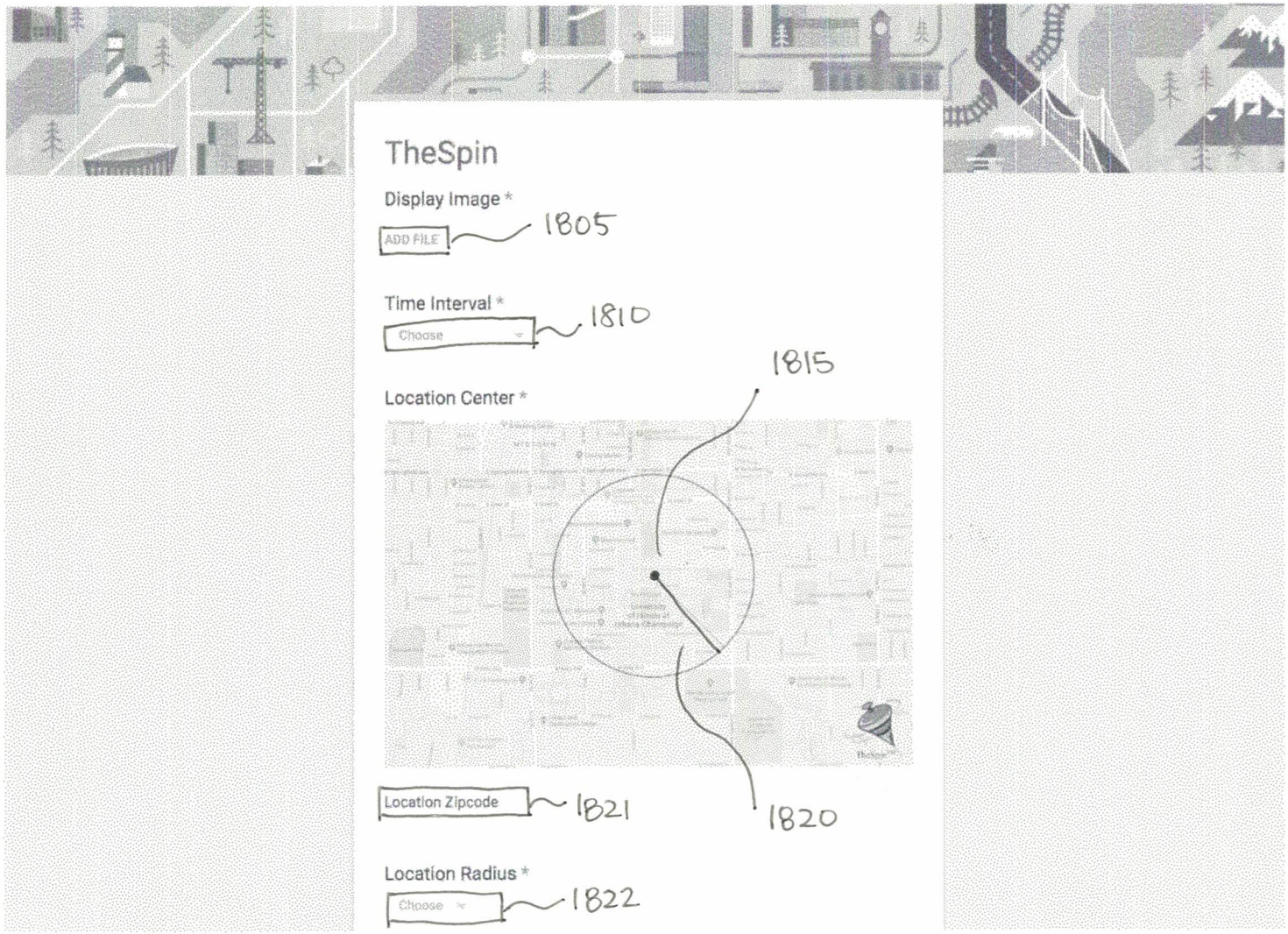


Figure 18A

1800

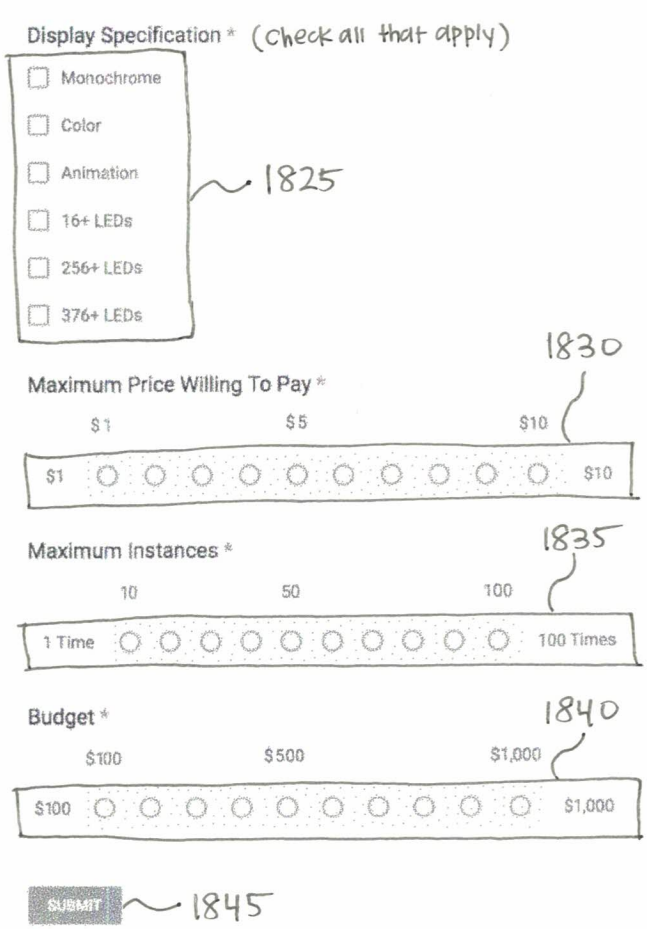


Figure 18B

1800


1905
1910
1940
1935
1900
1915
1920
1925
1930
MIDTOWN
W Springfield Ave
E Springfield Ave
E Green St
W Green St
W Kirby Ave
S First St
S Wright St
S Lincoln Ave
S Vine St
Champaign Public Library
County Market
Illini Union Bookstore
Spurlock Museum
Sherman Hall
Ikenberry Dining Center
South Quad
University of Illinois at Urbana-Champaign
Urbana Middle School
Carle Park
Blair Park
Hilton Garden Inn Champaign/ Urbana
Hessel Park
E-14 Parking Lot
I Hotel and Conference Center
Florida and Lincoln Playing Field
University of Illinois Arboretum
TheSpin™

Figure 19