

CERTIFICATE OF TRANSLATION ACCURACY

I am a professional reviewer and coordinator specializing in translating Japanese, Korean, and Chinese to English and vice versa.

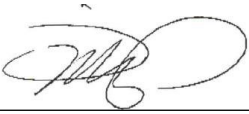
I served as Chief Examiner of the certified court interpreter test for the State of California and as a contract translator and interpreter for various federal agencies through the U.S. Department of State for more than a decade. I served as an instructor at the University of California at Berkeley and the Middlebury Institute of International Studies at Monterey (MIIS) Graduate Program in Translation.

I have more than 30 years of experience reviewing thousands of technical, legal, and business documents from Japanese to English submitted to, among others, Japanese judicial authorities, U.S. federal courts, the U.S. International Trade Commission (ITC), and the USPTO Patent Trial and Appeal Board (PTAB).

I certify that the following document translated from Japanese to English is a true, correct, and complete translation of the corresponding source text to the best of my knowledge and ability.

I certify under penalty of perjury that the foregoing is true and correct.

Executed this 27th day of March 2025 in Contra Costa County of the State of California.

By: 

Alex N. Jo
Member, ATA

(19) Japan Patent Office (JP)

(12) **Patent Application Gazette** (A)

(11) Application Publication No.

2005-12973

(P2005-12973A)

(43) Appl. Published: Jan. 13, 2005

(51) Int. Cl. ⁷	FI	Theme code (for reference)
H02J 17/00	H02J 17/00	5K027
H04B 7/26	H04M 1/73	5K067
H04M 1/73	H04B 7/26	
H04Q 7/38	H04B 7/26	109R

Request for examination: Yet to be requested Number of claims: 14 OL (14 pages in total)

(21) Appl. No.:	2003-177054 (P2003-177054)	(71) Applicant:	000004237
(22) Filed:	Jun. 20, 2003		NEC Corporation
			5-7-1, Shiba, Minato-ku, Tokyo
		(74) Attorney or Agent:	100071272
			Yosuke Goto, patent attorney
		(74) Attorney or Agent:	100077838
			Noriyasu Ikeda, patent attorney
		(72) Inventor:	Mitsuhiro Watanabe
			% NEC Corporation, 5-7-1, Shiba, Minato-ku, Tokyo
		(74) F terms (for reference):	5K027 AA11 AA13 BB17 CC08 HH23
			5K067 AA43 BB02 BB21 CC21 DD17
			DD27 EE02 GG01 GG11 KK05

(54) (Title of the Invention) WIRELESS COMMUNICATION SYSTEM

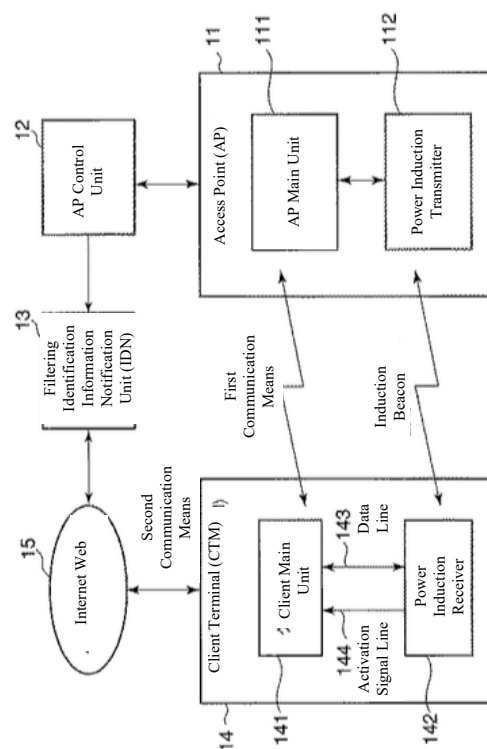
(57) [ABSTRACT]

[PROBLEM] To reduce the power consumed by a mobile terminal detecting an access point.

[SOLUTION]

A power induction transmitter 112 is provided at an access point 11 and a power induction receiver 142 is provided at a client terminal 14. The power induction transmitter supplies power to the power induction receiver and sends out an induction beacon to report transmitter identification information. The power induction receiver activates upon receiving the induction beacon and compares the transmitter identification information contained in the induction beacon with preset filtering identification information. If these sets of identification information match, the power induction receiver activates the client main unit 141, and data communication takes place between the client main unit and an AP main unit.

[SELECTED DRAWING] FIG. 1



[SCOPE OF PATENT CLAIMS]

[CLAIM 1]

A wireless communication system containing an access point and a terminal equipped with a wireless communication unit for wirelessly communicating with the access point, wherein the access point is provided with a power induction transmitter that transmits transmitter identification information associated with the access point using a power supply signal that contactlessly supplies power to the terminal, and the terminal is provided with a power induction receiver that activates upon receiving the power supply signal and compares the transmitter identification information contained in the power supply signal with preset filtering identification information to activate the wireless communication unit if the sets of information match.

[CLAIM 2]

The wireless communication system set forth in claim 1, provided further with a control unit for storing prescribed information relating to the access point and a filtering identification information unit that selectively retrieves information relating to the terminal from the prescribed information stored in the control unit to generate filtering identification information.

[CLAIM 3]

The wireless communication system set forth in claim 2, wherein the terminal is provided with a communication unit different from the wireless communication unit for acquiring the AP identification information from the identification information notification unit.

[CLAIM 4]

A wireless communication system containing an access point and a client terminal, wherein the access point is provided with an AP-side data communication unit for wirelessly communicating data with the client terminal, and a power induction transmitter that contactlessly supplies power to the client terminal and transmits a beacon for transmitting unique transmitter identification information assigned to the access point, and the client terminal is provided with a client-side data communication unit for wirelessly communicating data with the access point, and a power induction receiver that activates upon receiving the beacon, and compares the transmitter identification information with preset filtering identification information to activate the client-side data communication unit to enable communication with the AP-side data communication unit if there is a match between the sets of information.

[CLAIM 5]

The wireless communication system set forth in claim 4, wherein the transmitter identification information is represented by a filter code having fields, and a comparison is made of the filtering identification information for each field.

[CLAIM 6]

The wireless communication system set forth in claim 4, wherein an access point control unit is further provided connected to the access point for collecting and storing individual identifiers assigned to the transmitter identification signal and the access point.

[CLAIM 7]

The wireless communication system set forth in claim 6, wherein the information gathered by the access point control unit is classified and the filtering identification information is generated and reported to the client terminal.

[CLAIM 8]

The wireless communication system set forth in claim 4, wherein the transmitter identification information contains a field for representing a service provider and a field for representing a type

of service provided by the service provider.

[CLAIM 9]

The wireless communication system set forth in claim 4, wherein the transmitter identification information contains information relating to a communication channel established with the access point and/or a field for representing a group ID of the access point.

[CLAIM 10]

The wireless communication system set forth in claim 4, wherein a group ID is set to the access point corresponding to a service provided by that access point, and a field for representing the group ID is provided in the transmitter identification information so that data communication can be carried out with only the access point providing a specific service.

[CLAIM 11]

The wireless communication system set forth in claim 4, wherein a group ID is set to the access point on the basis of a service provider with a relationship to that access point, and a field for representing the group ID is provided in the transmitter identification information so that data communication can be carried out with only the access point with a relationship to a specific service provider.

[CLAIM 12]

The wireless communication system set forth in claim 4, wherein communication channel information is included in the transmitter identification information so that when the client-side data communication unit is activated, negotiation is carried out for starting communication with the AP-side data communication unit through the communication channel indicated by the communication channel information.

[CLAIM 13]

The wireless communication system set forth in claim 4, wherein once communication between the client-side data communication unit and the AP-side data communication unit starts and then becomes impossible, the power source of the client-side data communication unit is disconnected or a transition is made to a power-saving mode.

[CLAIM 14]

The wireless communication system set forth in claim 4, wherein once communication between the client-side data communication unit and the AP-side data communication unit starts and then becomes impossible, the client-side data communication unit is kept in an operation state until a predetermined time passes, and if the predetermined time passes without communication starting again, the client-side data communication unit is disconnected or a transition is made to a power-saving mode.

[DETAILED DESCRIPTION OF THE INVENTION]

[0001]

[TECHNICAL FIELD OF THE INVENTION]

The present invention relates to a wireless communication system for near- and medium distance using a wireless LAN, Bluetooth, UWB, or the like and in particular relates to power saving thereof.

[0002]

[CONVENTIONAL ART]

Wireless communication systems have been proposed that use a wireless LAN, Bluetooth, UWB, and other short- and medium-range wireless communication technologies to provide information and the like to mobile terminals (client terminals) that enter a predetermined area. In this type of wireless communication system, an access point, for example covering a predetermined area can be installed at a station to provide information on the area around the station to the mobile terminals of users using the station. The mobile terminals can be mobile phones and other devices equipped with short- or medium-range wireless communication units.

[0003]

In this type of wireless communication system, a scan must be performed from the mobile terminal side or a response mode to a scan from the access point in order to establish a wireless circuit between the mobile terminal and the access point. To do so, it is necessary to supply power to the wireless communication unit, but supplying power constantly is unfavorable because the power source of a mobile terminal is a battery. Therefore, in a conventional wireless communication system, power is supplied to the wireless unit cyclically (intermittently), and, when a radio wave is received from an access point, power is supplied continuously (refer, for example, to Patent Document 1).

[0004]

[Patent Document 1]

Japanese Patent Application Publication No. 2001-298780

[0005]

[PROBLEM TO BE SOLVED BY THE INVENTION]

In a conventional wireless communication system, power is intermittently supplied to the wireless unit to curb battery drain in the mobile terminal. However, under normal conditions of use, the time that the mobile terminal is outside the area covered by the access point is much longer than the time inside the area. That is, conventional wireless communication systems have the problem of large power consumption wasted in the mobile terminal, i.e., a short battery life.

[0006]

Here, if external power is supplied to the mobile terminal, battery drain can be curbed. However, to supply the power needed by the wireless unit of the mobile terminal in a contactless manner, the mobile terminal must be brought into close proximity to the power source, which is not practical.

[0007]

Therefore, it is an object of the present invention to provide a wireless communication system capable of reducing power consumption outside of when the mobile terminal is communicating data with an access point, extending battery life.

[0008]

It is also an object of the present invention to provide a wireless communication system in which data communication is made only with a predefined access point and not with other access points.

[MEANS TO SOLVE THE PROBLEM]

[0009]

According to the present invention, a wireless communication system is obtained containing an access point and a terminal equipped with a wireless communication unit for wirelessly communicating with the access point, wherein the access point is provided with a power induction transmitter that transmits transmitter identification information associated with the access point using a power supply signal that contactlessly supplies power to the terminal, and the terminal is provided with a power induction receiver that activates upon receiving the power supply signal and compares the transmitter identification information contained in the power supply signal with preset filtering identification information to activate the wireless communication unit if the sets of information match.

[0010]

According to the present invention, a wireless communication system is obtained containing an access point and a client terminal, wherein the access point is provided with an AP-side data communication unit for wirelessly communicating data with the client terminal, and a power induction transmitter that contactlessly supplies power to the client terminal and transmits a beacon for transmitting unique transmitter identification information assigned to the access point, and the client terminal is provided with a client-side data communication unit for wirelessly communicating data with the access point, and a power induction receiver that activates upon receiving the beacon and compares the transmitter identification information with the filtering identification information to activate the client-side data communication unit to enable communication with the AP-side data communication unit when there is a match between the sets of information.

[0011]

[EMBODIMENTS FOR REDUCING THE INVENTION TO PRACTICE]

Embodiments of the present invention are described below in detail with reference to the drawings.

[0012]

A configuration of the wireless communication system according to an embodiment of the present invention is shown in FIG. 1. This wireless communication system includes at least one access point (AP) 11 connected to a network (e.g., LAN) not illustrated, at least one AP control unit 12 that controls information pertaining to the access point 11, a filtering identification information notification unit (IDN) 13 connected to all of the AP control units 12, and at least one client terminal 14 that communicates with an electronic information device (e.g., server), not illustrated, connected to the network via the access point 11.

[0013]

One access point 11 is ordinarily installed for each service provider. Therefore, if there are three service providers, then at least one access point per provider, a total of at least three, is provided.

[0014]

Each of the access points 11 has an AP main unit (AP-side data communication unit) 111 as a first communication means for wireless communication (data communication) with the client terminal 14. The AP main unit 111 functions as a bridge or router between the wireless LAN or the like formed with the client terminal 14 and the network to which this access point 11 is connected. In addition, each access point 11 has a power induction transmitter 112 that continuously or intermittently (cyclically) generates an induction beacon (power supply signal) that uses the first communication means to supply power contactlessly by electromagnetic induction or the like to the client terminal 14 located within the communication area and reports transmitter identification information.

[0015]

The transmitter identification information reported by the power induction transmitter 112 of each access point 11 includes a plurality of fields. For example, as shown in FIG. 2, the transmitter identification information is assigned a company code 201 indicating the service provider that provides information and other services to the client terminal 14 using that access point 11, a service code 202 indicating the type of service that can be provided via that access point 11, and a unique code 203 unique to that power induction transmitter 112. These codes are collectively referred to as the filter codes. The unique code 203 can also be used to identify the access point 11 individually. This field structure of the transmitter identification information is a common structure used when utilizing various types of internet services.

[0016]

The service provided by each access point 11 can be configured as desired. For example, if a service provider C1 is capable of providing services S1 and S2, some access point 11 can be configured to provide the services S1 and S2 and another access point 11 configured to provide only the service S1. In this case, the transmitter identification information reported by these two access points is shown in FIG. 3(a) and (b), respectively. By configuring the service content to be provided for each access point 11 in this way, services can be selectively provided according to the location of the access point 11 and the bandwidth required, and cost increases can be avoided because there is no need to provide each access point 11 with more capacity than necessary.

[0017]

Also, if the service provider C2 is capable of providing the services S1 and S2 and a service S3, some access point 11 can be configured to provide the services S1 and S3 and another access point 11 to provide only the service S2. In this case, the transmitter identification information reported from these two access points is as shown in FIG. 3(c) and (d), respectively. By thus using different

access points 11 for each service, it is possible to provide quality of service (QoS) services that require a certain bandwidth, such as VoIP, and services such as in a best-effort network via different access points 11.

[0018]

Note that, as depicted in FIG. 4 (a) or (b), a communication channel code or a group ID such as ESSID (Expanded Service Set Identification) may be included in the transmitter identification information. Moreover, both of these, as well as various types of setting information regarding other access points may be included. Embedding, in the transmitter identification information, a code indicating the communication channel (and band) enables a reduction in power consumption through reducing the negotiation operations thereafter when the client terminal 14 achieves data communication with the access point. Moreover, providing the ESSID in the transmitter identification information enables the ESSID set up, which should be performed by the user, to be executed automatically. In addition, if a group ID is assigned for each type of service or for each service provider, the group ID can be used to carry out data communication with only those access points 11 that provide specific services or that are with specific service providers.

[0019]

Moreover, the transmitter identification information may have a field for embedding information other than the information set forth above. For example, a start code for detecting the start of a beacon, or a CRC code able to detect a bit error in beacon data, may be included.

[0020]

Moreover, the sequence (arrangement) of each of the fields in the transmitter identification information is arbitrary, but when each code arrives in a time series, preferably fields are assigned such that codes that are used in filtering will arrive first.

[0021]

An AP control unit 12, as with the access point 11, is equipped for each service provider (provider). Each access point 11 is connected to an AP control unit 12 for each service provider. That is, at least one access point 11 is connected to each AP control unit 12. Note that the AP control unit 12 and the access point 11 may be connected through a dedicated line, or may be connected through an aforementioned network.

[0022]

Each AP control unit 12 associates, and controls the storing of, individual identifiers, such as MAC addresses, or the like, that are assigned to each of the associated access points 11, the ESSID that is assigned to the group of which the access point 11 is a member, (unique) individual identification information that is unique to the power induction transmitter 112 of the access point 11, along with other information.

[0023]

Moreover, the AP control unit 12 is configured with functions to retrieve registered information and extract only that information that matches an arbitrary condition. For example, it may be possible to extract, from among all of the access points 11 that are subject to control, individual identification information that is unique to a power induction transmitter 112 of an access point 11 that is assigned a specific ESSID, or to extract information indicating the types of services provided by those access points 11. Moreover, the AP control unit 12, in response to a request from a filtering identification information notification unit 13, that information that matches the requested condition, and send it to the filtering identification information notification unit 13.

[0024]

The filtering identification information notification unit 13 is connected to all AP control units 12 through dedicated lines or through the aforementioned network, and is also connected to the internet 15.

[0025]

The filtering identification information notification unit 13 may collect and classify information that is stored in the AP control units 12, and is able to extract information in accordance with an arbitrary condition. That is, the filtering identification information notification unit 13, in response to an instruction from an administrator or a request from a client terminal 14 generates, from information controlled by the AP control units 12, identification information for filtering in response to the instruction or corresponding to the client terminal 14.

[0026]

The client terminal 14 has a client main unit 141 that is provided with a first and a second communicating portion. Here the first communicating portion (client-side data communicating portion) is used as first communication means for carrying out data communication with an AP main unit 111 of an access point 11, and the second communicating portion is used as second communication means for communicating, through the internet 15, with the filtering identification information notification unit 13. Moreover, the client terminal 14 has a power induction receiver 142 that is started up by receiving a beacon from a power induction transmitter 112 of an access point 11, and compares, against setting information that has been set in advance, identification information included in the beacon, to start up the client main unit 141 when the comparison result is a match. Information set in the power induction receiver 142 is identification information for filtering, generated by the filtering identification information notification unit 13, and is set by the client main unit 141.

[0027]

Note that in the present invention, short- and medium-distance wireless communication devices, such as wireless LANs, wireless communication devices based on Bluetooth, or communication devices that use UWB, or the like, are envisioned as the first communication means for achieving wireless communication between the AP main unit 111 and the client main unit 141. Mobile telephone devices, stationary telephone sets, or physically wired LANs, or the like, are envisioned as the second communication means by which the client terminal 14 accesses the internet 15.

[0028]

The operation of the wireless communication system of FIG. 1 will be described in detail below in reference to FIG. 5 through FIG. 8.

[0029]

FIG. 5 is a diagram showing the operating sequences for each part when carrying out an automatic update of the identifying information for filtering on a client terminal 14 that is already receiving service.

[0030]

First, when an access point 11 is newly equipped or there is a change in services provided therethrough, the AP main unit 111 of the access point 11 reads out transmitter identification information from the power induction transmitter 112 (S301). The AP main unit 111 then sends the transmitter identification information that has been read out to the AP control unit 12 as AP identification removal, along with the AP identifier assigned to that access point 11 (S302).

[0031]

The AP control units 12, upon receipt of notification of the AP identifying information from the access point 11 stores and controls, in mutual association, the transmitter identification information and AP identifier that are included therein (S303).

[0032]

The filtering identification information notification unit 13, in response to an instruction from an administrator, reads out the transmitter identification information and AP identifier from all of the AP control units 12 (S304, S305).

[0033]

The filtering identification information notification unit 13 classifies, into each of the fields for the identification information for filtering, the information collected from all of the AP control units 12 (referencing FIG. 2) (S306), and generates identification information for filtering in accordance with the applicable client terminal 14 (S307). Given this, the filtering identification information notification unit 13 sends, to the applicable client terminal through the internet 15, the identification information for filtering that has been generated (S308).

[0034]

The client terminal 14 writes, to the power induction receiver 142, the identification information for filtering that has been sent from the filtering identification information notification unit 13 (S309).

[0035]

As described above, when an access point 11 is added, or when there is a change in the details of the services provided thereby, the filtering information identifying information is updated automatically for the client terminal 14 that is to receive the services.

[0036]

The operations when a client terminal 14 first receives services will be explained next.

[0037]

First the user of the client terminal 14 and the service provider that is to carry out the service, such as providing information using the access point 11, enter into a contract for receiving services. The user learns thereby how to access the filtering identification information notification unit 13 to acquire the identification information necessary for filtering in order to receive services based on the contract.

[0038]

The client main unit 141 is started up through the user operating the client terminal 14 to access the filtering identification information notification unit 13 from the second communicating portion through the internet 15.

[0039]

Upon updating the identification information for filtering in response to a request from the client terminal 14, the filtering identification information notification unit 13 generates and provides identification information for filtering in accordance with the client terminal 14, in the same manner as described above.

[0040]

Here let us assume that the filtering identification information notification unit 13 is connected to three AP control units 11-1, 11-2, and 11-3, as shown in FIG. 6. Moreover, the AP control units 11-1, 11-2, and 11-3 are operated by respective service providers C1, C2, and C3, where the AP control unit 11-1 controls services S1, S2, and S3, the AP control unit 11-2 controls services S2 and S3, and the AP control unit 11-3 controls service S3.

[0041]

In such a case, with the company codes indicating each of the companies as "C1," "C2," and "C3," and the service codes indicating each of the services as "S1," "S2," and "S3," the filtering identification information notification unit 13 is able to obtain the information of "C1: (S1 S2 S3), C2: (S2 S3), and C3: S3." The filtering identification information notification unit 13 selects and combines appropriate codes from the information that has been obtained, to generate identification information for filtering in accordance with the client terminal 14.

[0042]

For example, if the user has a contract for receiving the service S1 from the service provider C1, the filtering identification information notification unit 13 will send "C1: S1" to the client terminal 14 as the identification information for filtering. Moreover, if the user has contracts with service applications C1, C2, and C3 for receiving all services, the filtering identification information notification unit 13 generates, and sends to the client terminal 14, the three identification information for filtering, "C1: (S1 S2 S3)," "C2: (S2 S3)," and "C3: S3". Moreover, if the user has a contract with service applications C1, C2, and C3 for receiving the service S3, the filtering identification information notification unit 13 generates, and sends to the client terminal 14, "C1 C2 C3): S3" as the identification information for filtering.

[0043]

Note that the example set forth above envisions a case wherein three bits are provided for the company code, with the first bit being "C1," the second bit being "C2" and the third bit being "C3," and three bits provided as the service codes, with the first bit being "S1," the second bit being "S2," and the third bit being "S3."

[0044]

When a client main unit 141 of a client terminal 14 receives, from the filtering identification information notification unit 13, identifying information for filtering, the identification information for filtering is set in the power induction receiver 142 through a data line 143. This enables the client terminal 14 to receive, thereafter, the contracted services through the access point 11. Note that at least a first wireless portion of the client main unit 141 is able to switch into a non-powered or low-power mode after the identification information for filtering has been set in the electric power induction receiver 142.

[0045]

The operations when the client terminal 14 receives a service provided through an access point 11 will be explained next.

[0046]

As illustrated in FIG. 7, the power induction transmitter 112 of an access point 11 applies transmitter identification information to the beacon (S501), to send it continuously or periodically (S502).

[0047]

When the power induction receiver 142 of a client terminal 14 receives the beacon, the transmitter identification information included therein is extracted and compared to identification information for filtering that has been set in advance (S503). If the comparison result is a match, the client main unit 141 is started up (S504).

[0048]

The operations for a client terminal 14 will be described below assuming the presence of three access points 11-1, 11-2, and 11-3, as illustrated in FIG. 8. Note that here the access points 11-1, 11-2, and 11-3 are provided by service providers C1, C2, and C3, respectively, but the client terminal 14 has a contract with only service provider C2.

[0049]

The power induction transmitters 112-1, 112-2, and 112-3 of access points 11-1, 11-2, and 11-3 either continuously or periodically transmit induction beacons 801, 802, and 803 to provide a power supply to the client terminal 14 at locations within the areas that are covered by each. As described above, each induction beacon includes a company code that indicates the service provider that has installed and controls the access point 11, a service code that indicates the types of services provided by the access point 11, and a unique code that is unique to the power induction transmitter 112 of that access point 11 (referencing FIG. 2). For example, the identification information "C1: S1: U1" is included in the induction beacon sent from access point 11-1, the identification information "C2: S2: U2" is included in the induction beacon sent from access point 11-2, and the identification information "C3: S3: U3" is included in the induction beacon sent from access point 11-3.

[0050]

In a state wherein there has been no operation by the user, the client terminal 14 will be in a low-power mode, with operations of both the client main unit and the power induction receiver halted. When the client terminal 14 enters into an area covered by any of the access points 11, the power induction receiver 142 receives an induction beacon sent from that access point 11, to be started up. In other words, the power induction receiver 142 receives a supply of power from the induction beacon, and commences operation. Given this, the power induction receiver 142 extracts identification information included in the induction beacon and compares it to the identification information for filtering that has been set in advance.

[0051]

For example, let us assume that the client terminal 14 has entered into an area 811 that is covered by the access point 11-1. Given this, the power induction receiver 142 receives the induction beacon 801 and is started up, and compares the transmitter identification information "C1: S1: U1," included therein, to the identification information for filtering that has been set in advance (which here is assumed to be "C2: S2"). This comparison is carried out for the company code and the service code. In the case set forth above, the company codes are "C1" and "C2," and thus are not a match, so a determination of no match is made, and no comparison is carried out for the service codes. The operation of the power induction receiver 142 is stopped when there is no match between the transmitter identification information and the identification information for filtering in this way. This stopping of operation will continue until a prescribed time has elapsed.

[0052]

Moreover, when the client terminal 14 has entered into an area 812 that is covered by the access point 11-2, the power induction

receiver 142 receives the induction beacon 802 and is started up, and compares the transmitter identification information "C2: S2: U2," included therein, to the identification information "C2: S2" for filtering. In this case, the company codes and service codes match, so the power induction receiver 142 determines that the identification information matches. In this case, the power induction receiver 142 transmits an activation signal to the client main unit 141 through a start line 144, to start up the client main unit 141.

[0053]

When the client main unit 141 is started up in this way, the client main unit 141 establishes a communication channel with AP main unit 111, through a publicly known scanning method, to initiate data communication. For example, if the first communication means is a wireless LAN, the ESSID is used for identifying the communication destination, and communication is carried out with an access point 11 for which the group information is a match. In this way, the client terminal 14 is able to carry out data communication with a server, or the like, of the service provider through the access point 11-2.

[0054]

Thereafter, when there is a reduction in the reception level of the signal transmitted from AP main unit 111, the client main unit 141 immediately, or after a prescribed time has elapsed, cuts the supply of power to the first communicating portion or enters into a low-power mode. Maintaining the client main unit 141 in an operating state for a prescribed amount of time even after the reduction in the reception level enables communication to be restarted more promptly after recovery of the radio signal state after a communication has been interrupted through a temporary reduction in the received signal level due to the effect of, for example, the amount of phasing noise.

[0055]

Moreover, when the client terminal 14 has moved into an area 813 covered by the access point 11-3, the power induction receiver 142 operates in the same manner as in the case of entering into the area 811. That is, when the client terminal 14 has entered into the area 813, if the client main unit 141 is still in the operating state despite communication with the access point 112-2 having been cut off through a reduction in the reception level, the client main unit 141 will operate as follows.

[0056]

Specifically, the client main unit 141 carries out a scan so as to restart communication, and receives a response from AP main unit 111-3 of the access point 11-3. Because this response includes the ESSID or WEP (Wired Equivalent Privacy), or the like, the client main unit 141 identifies that the communication is not with the access point 11-2. Upon identification that the other side in the communication has changed, the client main unit 141, either immediately or after a prescribed time, cuts off the supply of power to the first communicating portion or enters a low-power mode. Thereafter, normal operations are carried out upon reception of the induction beacon from the access point 11-3.

[0057]

As described above, use of the identification information for filtering enables the client terminal 14 to filter for access points for which there is a contract and access points for which there is no contract, to selectively communicate wirelessly with only the access point 11 for which there is a contract, to thereby receive services based on the contract.

[0058]

In the present embodiment, not only is the power induction receiver 142 able to operate by receiving a supply of power from the access point 11, but can determine whether or not to start up the first radio portion thereof and then start the first radio portion, enabling the power consumption when the client terminal is not communicating with an access point to be substantially zero. Note that this is possible because the power consumption by the power induction receiver 142 is extremely small when compared to scanning access points (when carrying out transmission operations).

[0059]

Moreover, because in the present invention the first radio portion of the client terminal 14 does not carry out wireless communication with an access point 11 for which wireless communication is not allowed (one for which there is no contract), this not only can achieve a reduction in unnecessary radio traffic and a reduction in power consumption, but can extend battery life as well.

[0060]

While the present invention was explained above in accordance with one embodiment, the present invention is not limited to the embodiment set forth above.

[0061]

For example, while in the explanation set forth above the filtering identification information notification unit 13 was accessed through the internet 15, a wireless or physically wired LAN, or the like, may be used instead.

[0062]

Moreover, while in the explanation above the explanation was primarily for a case wherein the client terminal 14 had a contract with a single service company for a single service, services may be received from a plurality of service providers instead. In this case, if there are contracts with a plurality of service providers to receive different services from each, a plurality of identification information for filtering, depending on the contracts, will be provided to the client terminal 14 from the filtering identification information notification unit 13. Each time the client terminal 14 enters into an area that is covered by any of the access point 11, the transmitter identification information is compared with each of a plurality of identification information for filtering. Moreover, when there are contracts with a plurality of service providers for identical services, the same identification information for filtering, depending on the contract, will be provided to the client terminal 14 by the filtering identification information notification unit 13. Each time the client terminal 14 enters into an area covered by any of the access points 11, the transmitter identification information and the identification information for filtering will be compared. At this time, when the company code of the identification information for filtering indicates that there are contracts with all service providers, the comparison may be carried out before the service code only, without carrying out a comparison for the company code.

[0063]

[Effects of the Invention]

The present invention enables a reduction in power consumption when not communicating with an access point, through enabling the wireless communicating portion to operate only when communication is possible with an access point, through receiving a supply of power and transmitter identification information from a beacon that is transmitted from the access point. Moreover, this can prevent unnecessary communication with an access point with which communication is not allowed, enabling a reduction in power consumption.

[Brief Description of the Drawings]

FIG. 1 is a block diagram depicting the structure of a wireless communication system according to one embodiment according to the present invention.

FIG. 2 is a diagram depicting the field structure for transmitter identification information used in the wireless communication system of FIG. 1.

FIG. 3 (a), (b), (c), and (d) are specific examples of transmitter identification information of FIG. 2.

FIG. 4 (a) and (b) are diagrams indicating other field structures for transmitter identification information used in the wireless communication system of FIG. 1.

FIG. 5 is a sequence diagram for explaining the operation for providing identification information for filtering.

FIG. 6 is a block diagram depicting the connection relationships between a plurality of AP control units and a filtering identification information notification unit.

FIG. 7 is a sequence diagram for explaining the operation of a client terminal.

FIG. 8 is a diagram for explaining the client terminal operation.

[Explanation of Reference Symbols]

11: Access Point

111: AP Main Unit

112: Power Induction Transmitter

12: AP Control Unit

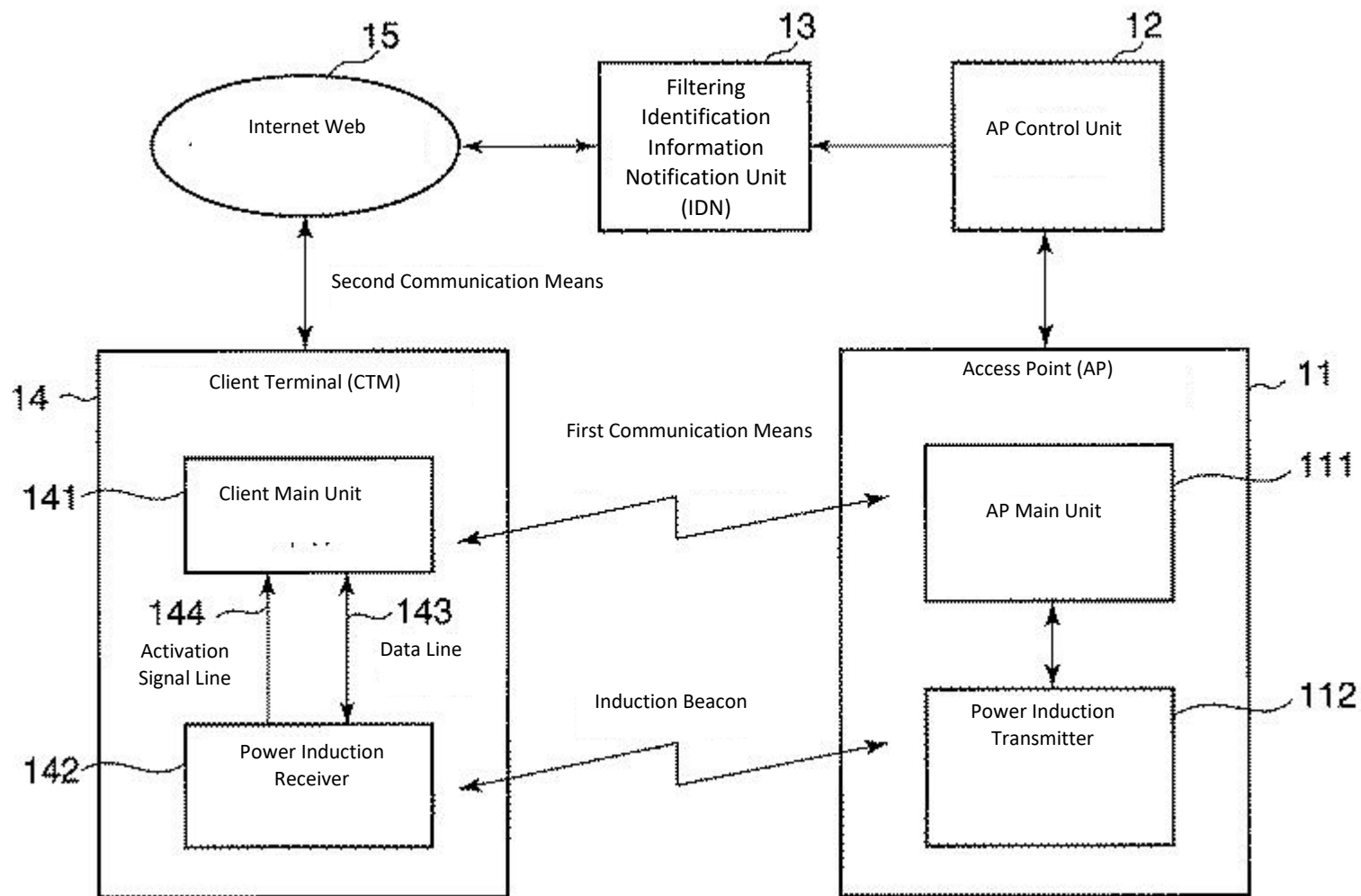
13: Filtering Identification Information Notification Units

14: Client Terminal

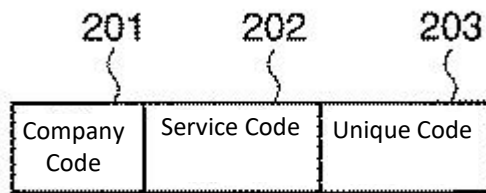
141: Client Main Unit

142: Power Induction Receiver
15: Internet

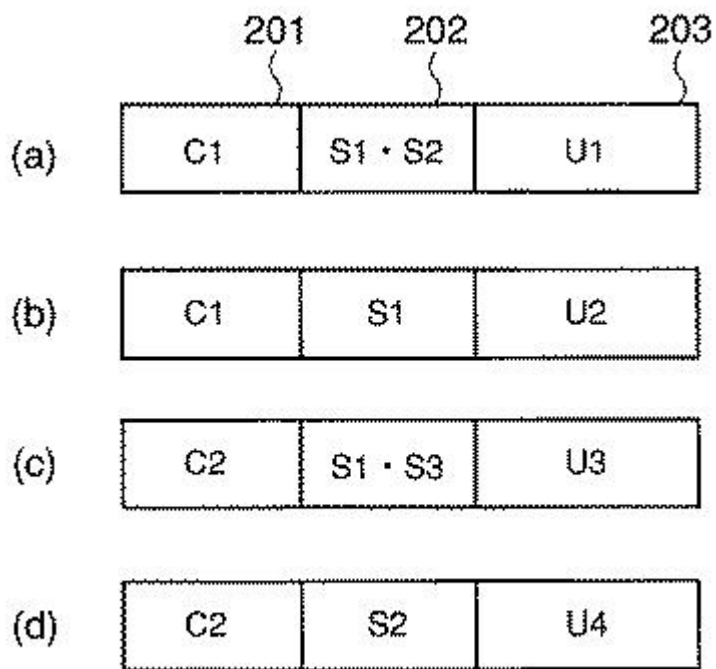
[FIG. 1]



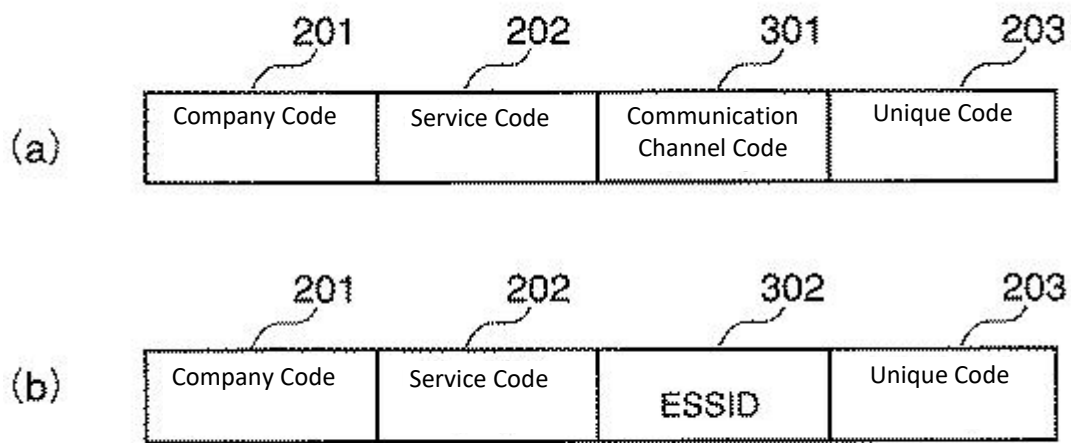
[FIG. 2]



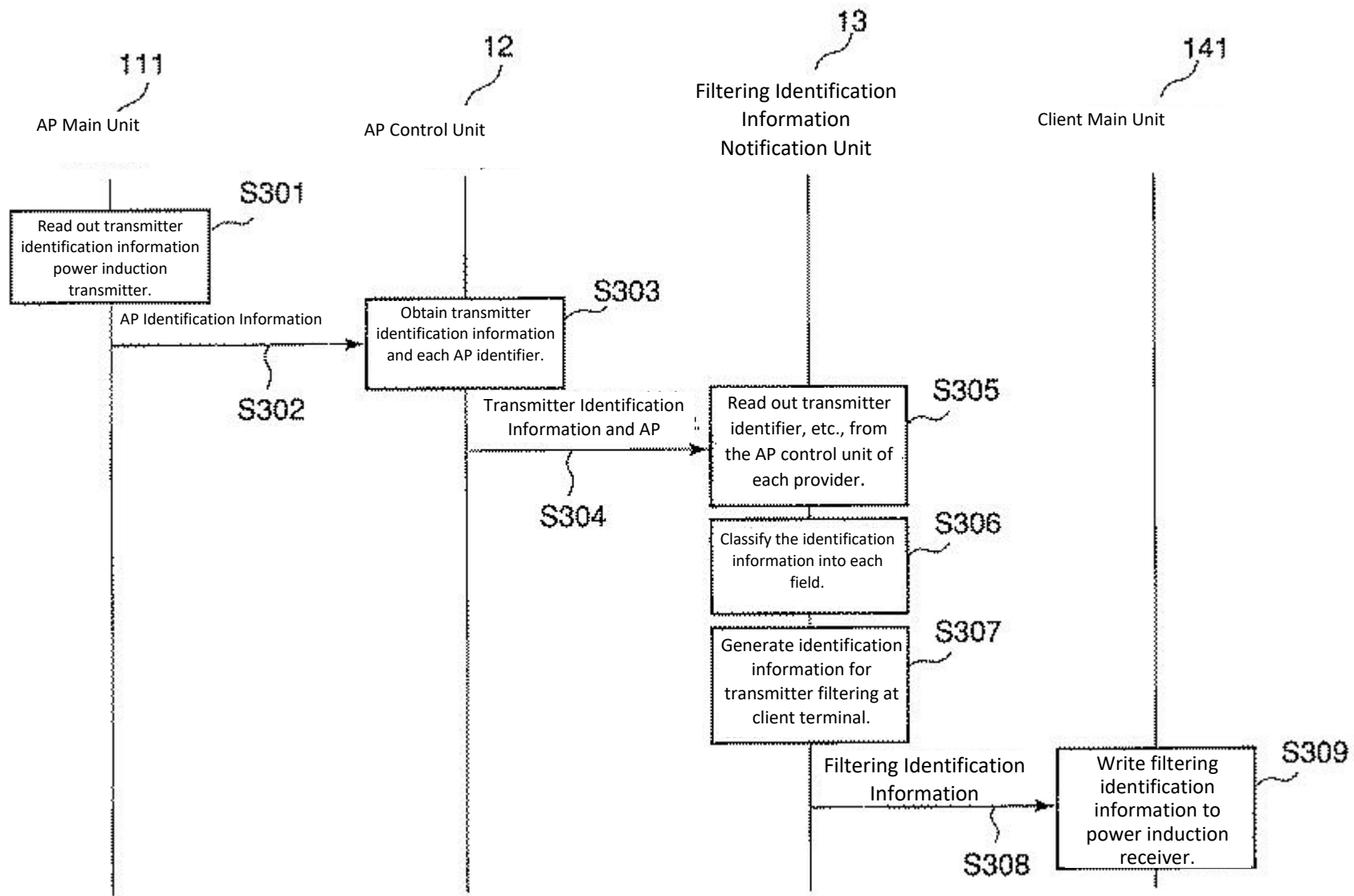
[FIG. 3]



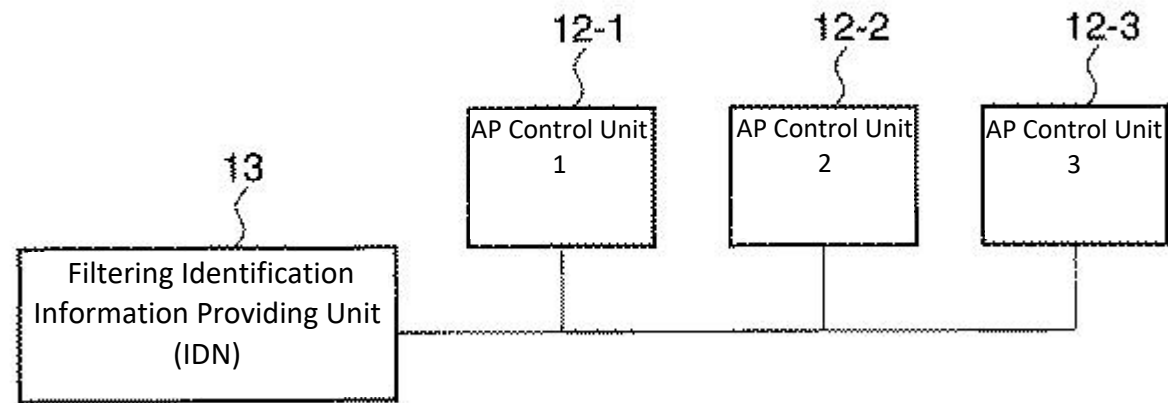
[FIG. 4]



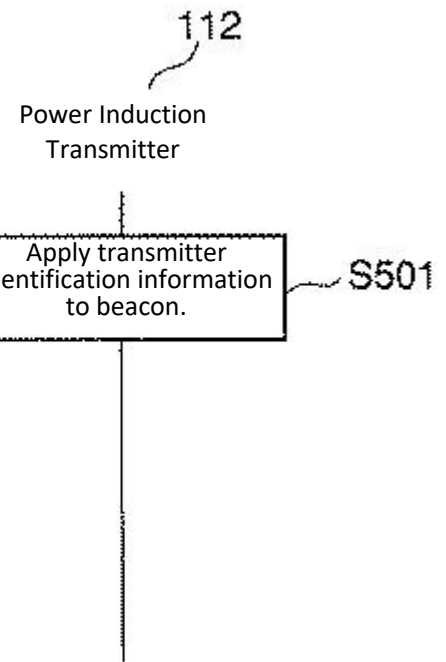
[FIG. 6]



[FIG. 5]



[FIG. 7]



Output beacon together with power induction.

142

Power Induction Receiver

Receive transmitter identification information on the beacon, and confirm match with transmitter identification information. S503

S504

141

Client Main Unit

If information matches, start the client main unit.

[FIG. 8]

