SCHEMES FOR CONNECTING TO WIRELESS NETWORK

BACKGROUND

[0001] The availability of third generation (3G) and fourth generation (4G) mobile telecommunications technologies, and Wi-Fi wireless access technologies make it possible to provide wireless data communications. It is generally preferable to use Wi-Fi networks for data transmission because Wi-Fi wireless access technologies are typically available at lower cost but with higher throughput than the third generation (3G) and/or fourth generation (4G) mobile telecommunications technologies. However, security for Wi-Fi wireless access technologies has drawn intense scrutiny.

SUMMARY

[0002] In an example, a method performed under control of an end device first device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

[0003] In another example, an end device may include a transmitting unit configured to transmit a probe request frame including a fake device identifier to an access point, a receiving unit configured to receive a probe response frame including information regarding the access point from the access point, a memory configured to store an authenticated access point list including information regarding at least one authenticated access point, a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list, and a connecting unit configured to connect to a wireless local area network provided by the access point. The transmitting unit is further

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configured to transmit a connection request including an original device identifier to the access point, and the receiving unit is further configured to receive an approval of the connection request from the access point.

[0004] In yet another example, a computer-readable storage medium may store thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, including transmitting a probe request frame including a fake device identifier of the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and transmitting a connection request including an original device identifier of the end device to the access point.

[0005] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

[0006] The foregoing and other features of this disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. With the understanding that these drawings depict only several embodiments in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[0007] **Fig. 1** schematically shows an illustrative example of a network communications environment including a mobile operating server, an access point and an end device, arranged in accordance with at least some embodiments described herein;

[0008] **Fig. 2** schematically shows an illustrative example of an authenticated access point list, arranged in accordance with at least some embodiments described herein;

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[0009] **Fig. 3** shows an example flow diagram of a process of an end device for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein;

[0010] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device, arranged in accordance with at least some embodiments described herein;

[0011] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein; and

[0012] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0014] This disclosure is generally drawn, *inter alia*, to methods, apparatuses, systems, devices, and computer program products related to secured wireless network communication schemes.

[0015] Technologies are generally described for connecting to wireless networks while preventing leakage of location information of an end device.

[0016] In general, in order to connect to a wireless local area network (WLAN), an end device may search for at least one available access point around the end device. By way of example, but not limitation, the access point may be a Wi-Fi access point and the WLAN may be a Wi-Fi network. When searching, the

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end device may transmit a probe request frame that may include a device identifier, for the end device such as a media access control (MAC) address of the end device. In such cases, since the probe request frame that includes the device identifier is transmitted to access points around the end device, present location information of the end device may be exposed to some access points with which a user of the end device does not want to be connected and/or other devices to which the end device does not want to disclose the present location information.

[0017] In some embodiments, an end device may transmit a probe request frame that includes a fake device identifier for the end device to at least one access point around the end device. As a response to the probe request frame, the end device may receive a probe response frame from one or more access points. The probe response frame may include information regarding the access point. By way of example, but not limitation, the information regarding the access point may include a MAC address of the access point and/or a service set identifier (SSID) of the access point.

[0018] The end device may determine whether there is an authenticated access point around the end device based at least in part on the information included in the probe response frame. If there is an authenticated access point around the end device, the end device may transmit a connection request including an authentic device identifier for the end device, such as an original MAC address, to the authenticated access point. Then, the end device may connect to a wireless local area network provided by the authenticated access point without a leakage of present location information of the end device to undesirable access points.

[0019] **Fig. 1** schematically shows an illustrative example of a network communications environment 100 including a mobile operating server, an access point, and an end device, arranged in accordance with at least some embodiments described herein.

[0020] As illustrated in Fig. 1, network communications environment 100 may include a mobile operating server 110, an access point 120 and an end device 130. Mobile operating server 110 may control access point 120. In Fig 1, although only one access point (i.e., access point 120) is located around end device 130, so that end device 130 is located in a network area 140 provided by access point 120, there could be two or more access points around end device 130.

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[0021] By way of example, access point 120 may include a Wi-Fi access point and provide a WLAN that includes a Wi-Fi network. Further, by way of example, end device 130 may include, but not exclusively, a personal communication terminal, such as PCS (Personal Communication System), GMS (Global System for Mobile communications), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), PDA (Personal Digital Assistant), IMT (International Mobile Telecommunication)-2000, CDMA (Code Division Multiple Access)-2000, W-CDMA (W-Code Division Multiple Access) and Wibro (Wireless Broadband Internet) terminals.

[0022] End device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include one or both of one or more random numbers or one or more random characters. In some embodiments, end device 130 may generate the fake device identifier and transmit the generated fake device identifier to access point 120. Further, in some other embodiments, mobile operating server 110 may provide end device 130 with the fake device identifier, and end device 130 may transmit the provided fake device identifier to access point 120.

[0023] End device 130 may receive a probe response frame from access point 120 to which end device 130 transmitted the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0024] End device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, end device 130 may receive an authenticated access point list including information regarding at least one authenticated access point from mobile operating server 110. End device 130 may determine whether access point 120 is an authenticated access point based at least in part on the authenticated access point list. By way of example, end device 130 may check whether the information regarding access point 120 is included in the authenticated access

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point list. If the information regarding access point 120 is included in the authenticated access point list, end device 130 may recognize access point 120 as an authenticated access point. By way of example, but not limitation, the authenticated access point may include an access point controlled by mobile operating server 110 and/or an access point previously connected with end device 130.

[0025] **Fig. 2** schematically shows an illustrative example of an authenticated access point list 200, arranged in accordance with at least some embodiments described herein. As illustrated in Fig. 2, authenticated access point list 200 may include the information regarding at least one authenticated access point. By way of example, but not limitation, the information regarding the least one authenticated access point may include a MAC address or an SSID of each authenticated access point.

[0026] Referring back to Fig. 1, end device 130 may transmit a connection request, including an authentic device identifier, to authenticated access point 120 for end device 130. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130. In some embodiments, the connection request may include an authentication request for authenticated access point 120 to authenticate end device 130. Further, the authentication request may include a shared key between access point 120 and end device 130.

[0027] End device 130 may receive an approval of the connection request from access point 120. In some embodiments, the approval of the connection request may include an authentication response.

[0028] End device 130 may transmit an association request to access point 120 in response to the approval of the connection request and, in response to the association request, access point 120 may transmit an association response to end device 130. Then, end device 130 may connect to the wireless local area network provided by access point 120.

[0029] **Fig. 3** shows an example flow diagram of a process 300 of an end device 130 for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. The method in Fig. 3 may be implemented in the network communication environment including mobile

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operating server 110, access point 120 and end device 130, as illustrated in Fig. 1. An example process may include one or more operations, actions, or functions as illustrated by one or more blocks 310, 320, 330, 340, 350 and/or 360. Although illustrated as discrete blocks, various blocks may be divided into additional blocks, combined into fewer blocks, or eliminated, depending on the desired implementation. Processing may begin at block 310.

[0030] At block 310 (Transmit Probe Request Frame), end device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include at least one of a random number or a random character. Processing may proceed from block 310 to block 320.

[0031] At block 320 (Receive Probe Response Frame), end device 130 may receive a probe response frame from access point 120 as a response to the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120. Processing may proceed from block 320 to block 330.

[0032] At block 330 (Determine Whether Access Point is Authenticated Access Point), end device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120 included in the probe response frame. In some embodiments, end device 130 may receive authenticated access point list 200, as illustrated in Fig. 2, from mobile operating server 110. Authenticated access point list 200 may include information regarding at least one authenticated access point.

[0033] At block 330, end device 130 may check whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point. Processing may proceed from block 330 to block 340.

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[0034] At block 340 (Transmit Connection Request), end device 130 may transmit a connection request including an authentic device identifier for end device 130 to access point 120 which is recognized as the authenticated access point at block 330. By way of example, but not limitation, the authentic device identifier may include an origianl MAC address of end device 130. Processing may proceed from block 340 to block 350.

[0035] At block 350 (Receive Approval of Connection Request), end device 130 may receive an approval of the connection request from access point 120. Processing may proceed from block 350 to block 360.

[0036] At block 360 (Connect to Wireless Local Area Network), end device 130 may connect to a wireless local area network provided by access point 120. By way of example, but not limitation, the wireless local area network provided by access point 120 may include a Wi-Fi network.

[0037] One skilled in the art will appreciate that, for this and other processes and methods disclosed herein, the functions performed in the processes and methods may be implemented in differing order. Furthermore, the outlined steps and operations are only provided as examples, and some of the steps and operations may be optional, combined into fewer steps and operations, or expanded into additional steps and operations without detracting from the essence of the disclosed embodiments.

[0038] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device 130, arranged in accordance with at least some embodiments described herein. As depicted in Fig. 4, end device 130 may include a fake device identifier generating unit 410, a transmitting unit 420, a receiving unit 430, a determination unit 440, a memory 450, and a connecting unit 460. Although illustrated as discrete components, various components may be divided into additional components, combined into fewer components, or eliminated altogether while being contemplated within the scope of the disclosed subject matter.

[0039] Fake device identifier generating unit 410 may generate a fake device identifier (for example, a fake MAC address) for end device 130. By way of example, but not limitation, the fake device identifier may include a random number and/or a random character.

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[0040] Transmitting unit 420 may transmit, to access point 120, a probe request frame which may include the fake device identifier generated by fake device identifier generating unit 410.

[0041] Receiving unit 430 may receive a probe response frame from access point 120 to which the probe request frame is transmitted. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0042] In some embodiments, receiving unit 430 may receive a fake device identifier (for example, a fake MAC address) for end device 130 from mobile operating server 110. In such cases, transmitting unit 420 may transmit, to access point 120, a probe request frame that includes the fake device identifier received from mobile operating server 110.

[0043] Determination unit 440 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, determination unit 440 may compare the information regarding access point 120, which is included in the probe response frame, and information regarding authenticated access points, which is included in authenticated access point list 200 as illustrated in Fig. 2. The information regarding the authenticated access points may include a MAC address and/or an SSID of each of the authenticated access points.

[0044] Determination unit 440 may determine whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point.

[0045] Memory 450 may store authenticated access point list 200. In some embodiments, receiving unit 430 may receive authenticated access point list 200 from mobile operating server 110 and memory 450 may store the received authenticated access point list 200. Further, memory 450 may store the fake device identifier which is generated by fake device identifier generating unit 410 or received from mobile operating server 110.

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[0046] Transmitting unit 420 may transmit a connection request, which includes an authentic device identifier, for end device 130 to access point 120 that is recognized as the authenticated access point by determination unit 440. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130.

[0047] Receiving unit 430 may receive an approval of the connection request from access point 120 and connecting unit 460 may connect to a wireless local area network provided by access point 120.

[0048] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. Program product 500 may include a signal bearing medium 510. Signal bearing medium 510 may include one or more instructions 520 that, when executed by, for example, a processor, may provide the functionality described above with respect to Figs. 1-4. By way of example, instructions 520 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to Fig. 4, end device 130 may undertake one or more of the blocks shown in Fig. 3 in response to instructions 520.

[0049] In some implementations, signal bearing medium 510 may encompass a computer-readable medium 530, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium 510 may encompass a recordable medium 540, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 510 may encompass a communications medium 550, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a

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wireless communication link, etc.). Thus, for example, program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 520, where the signal bearing medium 520 is conveyed by a wireless communications medium 550 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

[0050] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. In these examples, elements of computing device 600 may be arranged or configured for a mobile operating server or an end device. In a very basic configuration 602, computing device 600 typically includes one or more processors 604 and a system memory 606. A memory bus 608 may be used for communicating between processor 604 and system memory 606.

[0051] Depending on the desired configuration, processor 604 may be of any type including but not limited to a microprocessor (μP), a microcontroller (μC), a digital signal processor (DSP), or any combination thereof. Processor 604 may include one more levels of caching, such as a level one cache 610 and a level two cache 612, a processor core 614, and registers 616. An example processor core 614 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processing core (DSP Core), or any combination thereof. An example memory controller 618 may also be used with processor 604, or in some implementations memory controller 618 may be an internal part of processor 604.

[0052] Depending on the desired configuration, system memory 606 may be of any type including but not limited to volatile memory (such as RAM), non-volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 606 may include an operating system 620, one or more applications 622, and program data 624.

[0053] Computing device 600 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 602 and any required devices and interfaces. For example, a bus/interface controller 630 may be used to facilitate communications between basic configuration 602 and one or more data storage devices 632 via a storage interface bus 634. Data storage devices 632 may be removable storage devices

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636, non-removable storage devices 638, or a combination thereof. Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0054] System memory 606, removable storage devices 636 and non-removable storage devices 638 are examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store the desired information and which may be accessed by computing device 600. Any such computer storage media may be part of computing device 600.

[0055] Computing device 600 may also include an interface bus 640 for facilitating communication from various interface devices (e.g., output devices 642, peripheral interfaces 644, and communication devices 646) to basic configuration 602 via bus/interface controller 630. Example output devices 642 include a graphics processing unit 648 and an audio processing unit 650, which may be configured to communicate to various external devices such as a display or speakers via one or more A/V ports 652. Example peripheral interfaces 644 include a serial interface controller 654 or a parallel interface controller 656, which may be configured to communicate with external devices such as input devices (e.g., keyboard, mouse, pen, voice input device, touch input device, etc.) or other peripheral devices (e.g., printer, scanner, etc.) via one or more I/O ports 658. An example communication device 646 includes a network controller 660, which may be arranged to facilitate communications with one or more other computing devices 662 over a network communication link via one or more communication ports 664.

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[0056] The network communication link may be one example of a communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and may include any information delivery media. A "modulated data signal" may be a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), microwave, infrared (IR) and other wireless media. The term computer readable media as used herein may include both storage media and communication media.

[0057] Computing device 600 may be implemented as a portion of a small-form factor portable (or mobile) electronic device such as a cell phone, a personal data assistant (PDA), a personal media player device, a wireless web-watch device, a personal headset device, an application specific device, or a hybrid device that include any of the above functions. Computing device 600 may also be implemented as a personal computer including both laptop computer and non-laptop computer configurations.

[0058] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems, which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

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[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (*e.g.*, bodies of the appended claims) are generally intended as "open" terms (*e.g.*, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (*e.g.*, "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (*e.g.*, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention

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analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0062] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0063] From the foregoing, it will be appreciated that various embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. Accordingly, the various

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embodiments disclosed herein are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

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CLAIMS

What is claimed is:

1. A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. The method of Claim 1, further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. The method of Claim 1, further comprising:

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receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

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a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. The end device of Claim 11, wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

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wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. A computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

22. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

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23. The computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. The computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

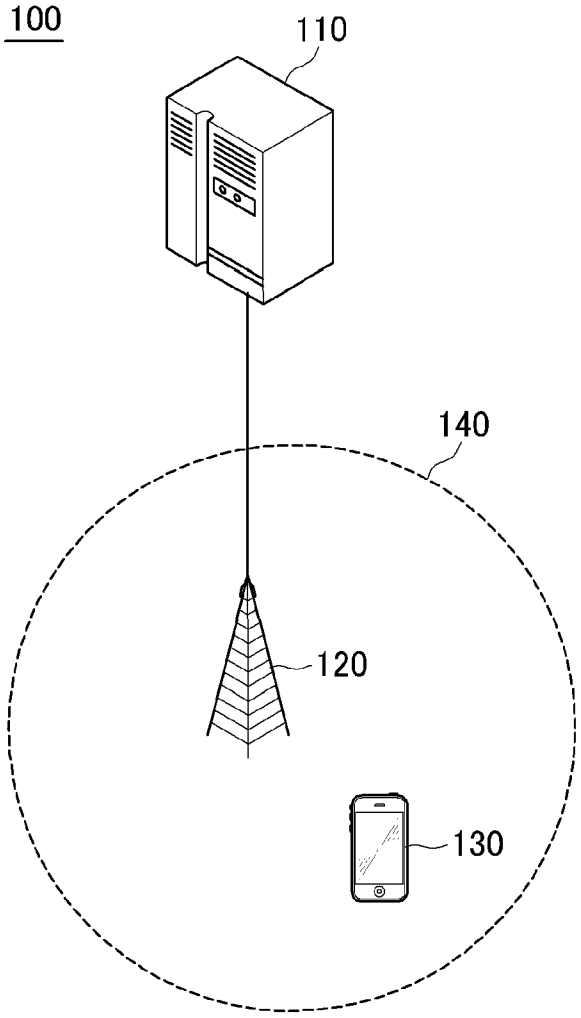
Copied from US1266306 on 09/20/2013 Petitioner's Exhibit 1003 Page 21 of 436

ABSTRACT

Technologies are generally described for connecting to a wireless local area network. In some examples, a method performed under control of an end device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

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FIG. 1



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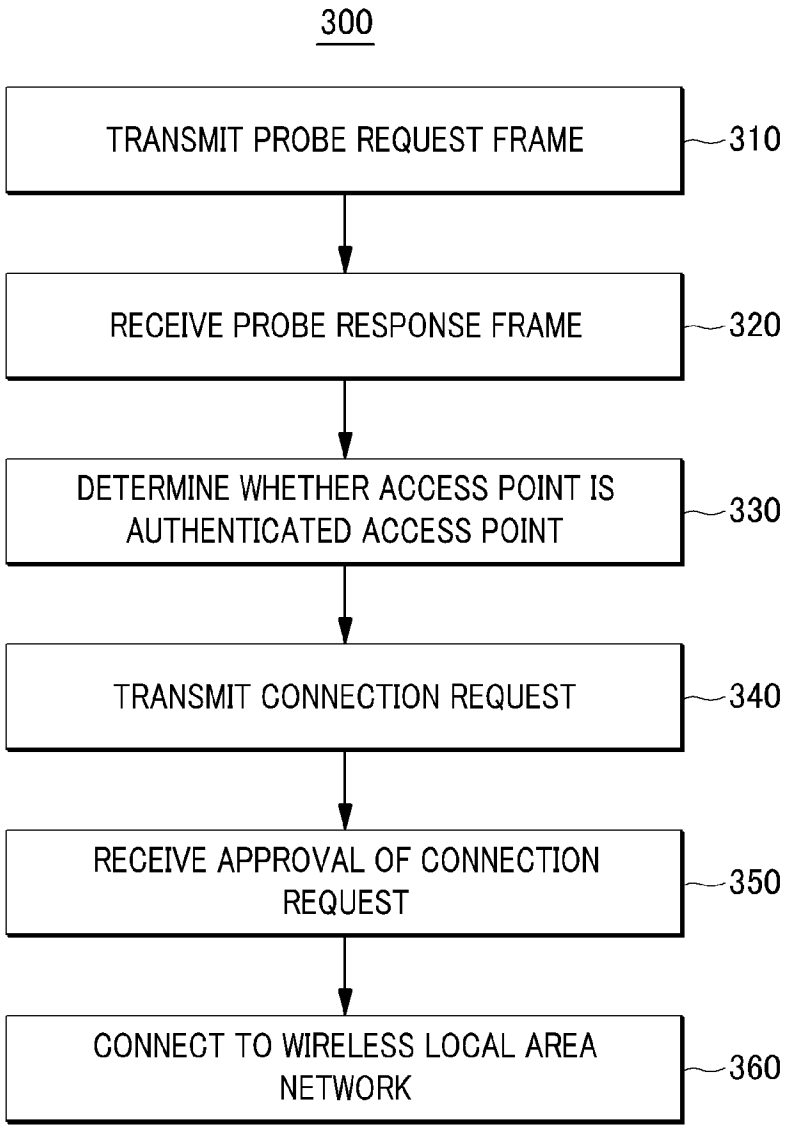
FIG. 2

200

ACCESS POINT	MAC ADDRESS	SSID
AUTHENTICATED ACCESS POINT 1	xxx111yyy	zzz
AUTHENTICATED ACCESS POINT 2	zzz222xxx	yyy
...	...	...

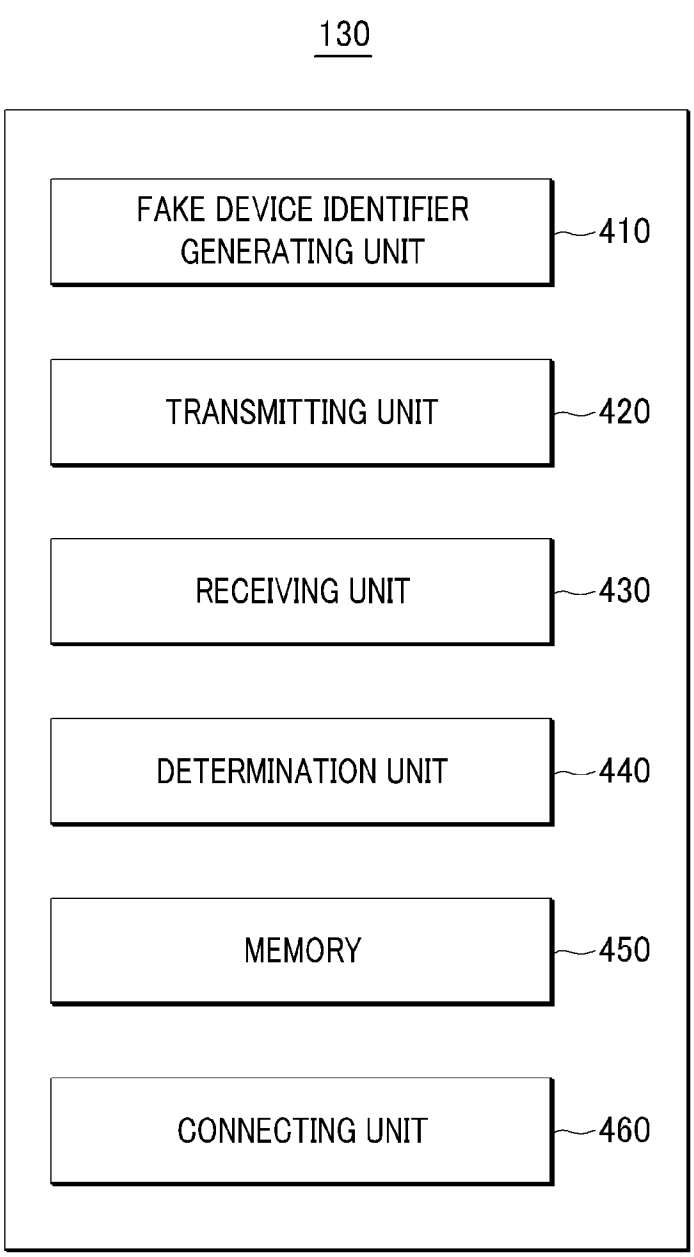
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FIG. 3



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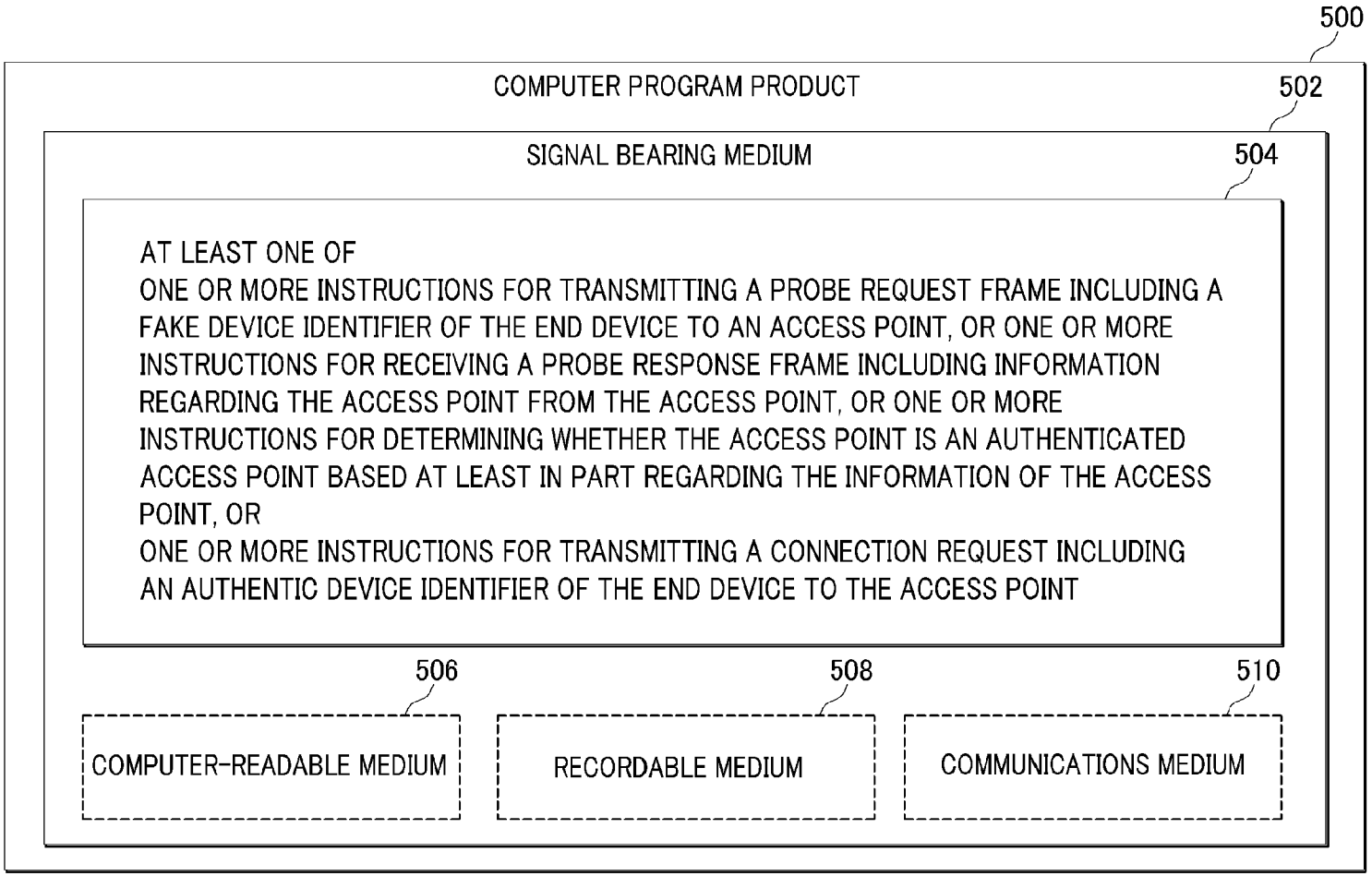
FIG. 4



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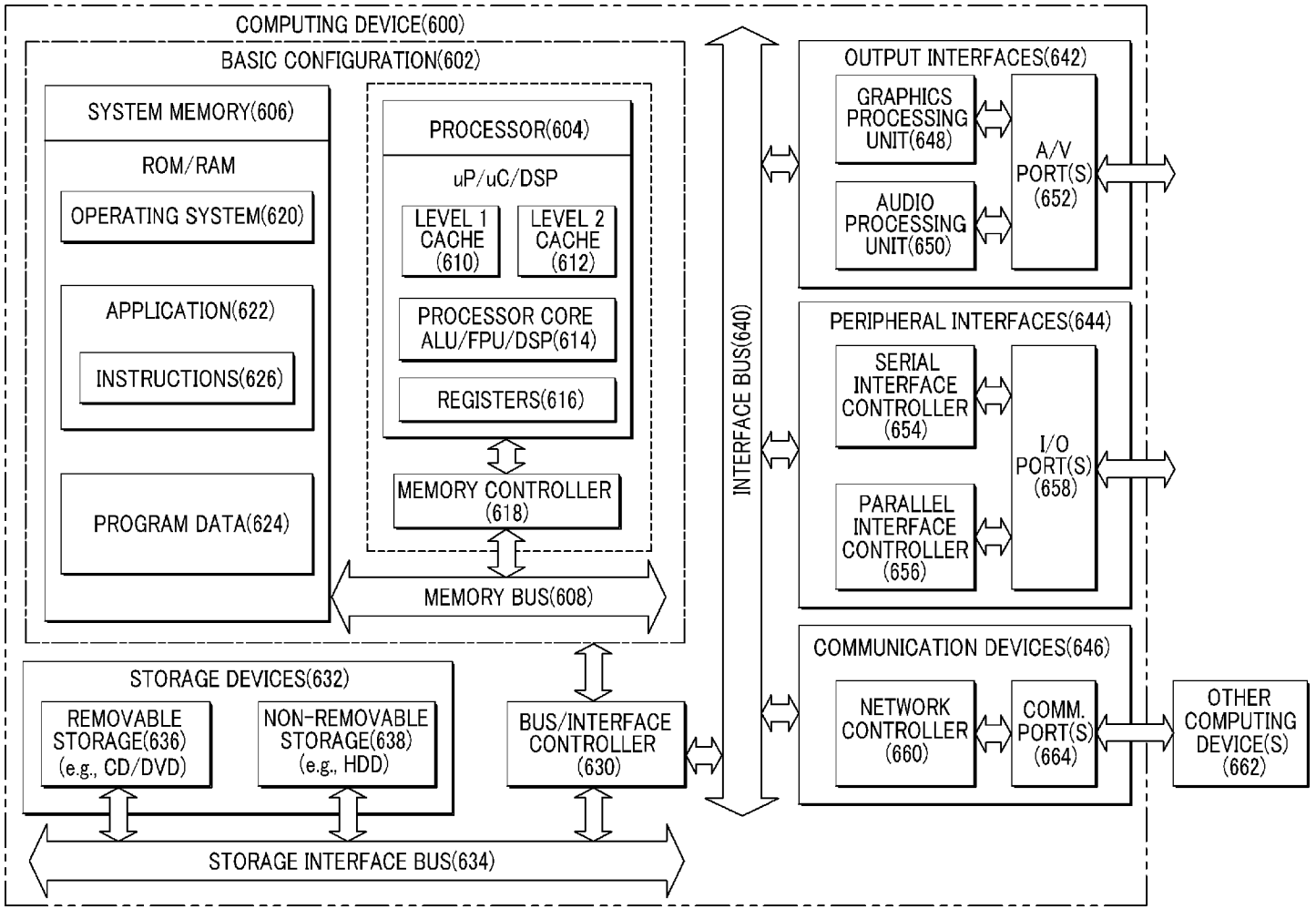
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FIG. 5



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FIG. 6



Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Empire Technology Development LLC
Filer:	David S. Lee/Nora Colston
Attorney Docket Number:	2582PCT.737BS

International Application for filing in the US receiving office Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Transmittal fee	1601	1	240	240
PCT Search Fee- no prior US appl filed	1602	1	2080	2080
Intl Filing Fee (1st-30 Pgs.) PCT Easy	1701	1	1254	1254
Suppl. Intl Filing Fee (each page > 30)	1703	2	15	30
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				

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Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**3604**

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Electronic Acknowledgement Receipt

EFS ID:	14291431
Application Number:	
International Application Number:	PCT/US12/66306
Confirmation Number:	8146
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Empire Technology Development LLC
Customer Number:	86636
Correspondence Address:	David S. Lee Brundidge & Stanger, P.C. 2318 Mill Road Suite 1020 Alexandria VA 22314 US 703-684-1470 dlee@brundidgestanger.com
Filer:	David S. Lee/Nora Colston
Filer Authorized By:	David S. Lee
Attorney Docket Number:	2582PCT.737BS
Receipt Date:	21-NOV-2012
Filing Date:	
Time Stamp:	15:49:40
Application Type:	International Application for filing in the US receiving office
Patent Number:	

Payment information:

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Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$3604
RAM confirmation Number	4470
Deposit Account	504888
Authorized User	LEE, DAVID S.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.445 (International application filing, processing and search fees)

Charge any Additional Fees required under 37 CFR 1.17(t) (Acceptance of an unintentionally delayed claim for priority)

Charge any Additional Fees required under PCT Rule 14

Charge any Additional Fees required under PCT Rule 15

Charge any Additional Fees required under PCT Rule 16

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		2582PCT_PCTRequestForm.pdf	788305 dde8bdb31da687ea352622425cb59ac57109a548	yes	5

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
RO/101 - Request form for new IA - Conventional	1	4
RO/101 - Annex (fee calculation sheet)	5	5

Warnings:

Information:

2		2582PCT_Application.pdf	209451 f9dad70d7cbb9aa88049fea1edf677c341701219	yes	28

Multipart Description/PDF files in .zip description		
Document Description	**Start**	**End**
Specification	1	16
Claims	17	21
Abstract	22	22
Drawings-only black and white line drawings	23	28

Warnings:

Information:

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3	Fee Worksheet (SB06)	fee-info.pdf	36485 bc68be136e55e7625c145b1e696deafeb2e2a407	no	2

Warnings:	
Information:	
Total Files Size (in bytes):	1034241

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

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This sheet is not part of and does not count as a sheet of the international application.

PCT

FEE CALCULATION SHEET

Annex to the Request

For receiving Office use only

International Application No. PCT/US12/66306

Date stamp of the receiving Office 21-11-2012

Applicant's or agent's file reference 2582PCT.737BS

Applicant

Empire Technology Development LLC

CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE	240.00 T	240
2. SEARCH FEE	2080.00 S	2080
International search to be carried out by US		
(If two or more International Searching Authorities are competent to carry out the international search, indicate the name of the Authority which is chosen to carry out the internattonal search.)		
3. INTERNATIONAL FILING FEE		
Enter total number of sheets indicated in Box No IX: 32		
i1 first 30 sheets	1254.00 i1	1254
i2 2 (number of sheets in excess of 30) x 15 (fee per sheet) =	30 i2	30
Add amounts entered at i1 and i2 and enter total at I	1284.00 I	
(Applicants from certain States are entitled to a reduction of 90% of the international filing fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 10% of the international filing fee.)		
4. FEE FOR PRIORITY DOCUMENT *(if applicable)*	P	
5. FEE FOR RESTORATION OF THE RIGHT OF PRIORITY *(if applicable)*	RP	
6. FEE FOR EARLIER SEARCH DOCUMENTS *(if applicable)*	ES	
7. TOTAL FEES PAYABLE — Add amounts entered at T, S, I, P, RP and ES, and enter total in the TOTAL box	3604.00 TOTAL	3604

MODE OF PAYMENT *(Not all modes of payment may be available at all receiving Offices)*

- ☐ authorization to charge deposit or current account (see below)
- ☐ postal money order
- ☒ credit card *(details should be furnished separately and not included on this sheet)*
- ☐ cash
- ☐ check
- ☐ bank transfer
- ☐ revenue stamps
- ☐ other *(specify):*

AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT OR CURRENT ACCOUNT

(This mode of payment may not be available at all receiving Offices)

- ☐ Authorization to charge the total fees indicated above.
- ☒ *(This check-box may be marked only if the conditions for deposit or current accounts of the receiving Office so permit)* Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.
- ☐ Authorization to charge the fee for priority document.

Receiving Office: RO/ US

Deposit or Current Account No.: 50-4888

Date: November 21, 2012

Name: David S. Lee

Signature: David S Lee

Form PCT/RO/101 (Annex) (16 September 2012) *See Notes to the fee calculation sheet*

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PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

PCT/US12/66306
International Application No.

(21.11.12) 21 NOVEMBER 2012
International Filing Date

PCT INTERNATIONAL APPLICATION RO/US
Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* 2582PCT.737BS

Box No. I TITLE OF INVENTION

SCHEMES FOR CONNECTING TO WIRELESS NETWORK

Box No. II APPLICANT ☐ This person is also inventor

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

Empire Technology Development
2711 Centerville Road, Suite 400
Wilmington, DE 19808
US

Telephone No.

Facsimile No.

Applicant's registration No. with the Office

E-mail authorization: Marking one of the check-boxes below authorizes the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send, notifications issued in respect of this international application to that e-mail address if those offices are willing to do so.

☐ as advance copies followed by paper notifications; or ☐ exclusively in electronic form (no paper notifications will be sent).

E-mail address:

State *(that is, country)* of nationality: US

State *(that is, country)* of residence: US

This person is applicant for the purposes of: ☒ all designated States ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

Lee, David S.
Brundidge & Stanger, P.C.
2318 Mill Road, Suite 1020
Alexandria, VA 22314
US

Telephone No. 703-684-1470

Facsimile No. 703-684-1460

Agent's registration No. with the Office 38,222

E-mail authorization: Marking one of the check-boxes below authorizes the receiving Office, the International Searching Authority, the International Bureau and the International Preliminary Examining Authority to use the e-mail address indicated in this Box to send, notifications issued in respect of this international application to that e-mail address if those offices are willing to do so.

☒ as advance copies followed by paper notifications; or ☐ exclusively in electronic form (no paper notifications will be sent).

E-mail address: dlee@brundidge-stanger.com

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

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Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

LEE, Hyoung-Gon
101-705, Daechi Hyundai APT. 974, Daechi 2-dong,
Gangnam-gu, Seoul, 135-850,
Republic of Korea

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☒ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

---

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

---

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

---

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ the States indicated in the Supplemental Box

---

☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

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Box No. V DESIGNATIONS

The filing of this request **constitutes under Rule 4.9(a) the designation** of all Contracting States bound by the PCT on the international filing date, for the grant of every kind of protection available and, where applicable, for the grant of both regional and national patents.

However,

☐ DE Germany **is not designated** for any kind of national protection

☐ JP Japan **is not designated** for any kind of national protection

☐ KR Republic of Korea **is not designated** for any kind of national protection

(The check-boxes above may only be used to exclude (irrevocably) the designations concerned if, at the time of filing or subsequently under Rule 26bis.1, the international application contains in Box No. VI a priority claim to an earlier national application filed in the particular State concerned, in order to avoid the ceasing of the effect, under the national law, of this earlier national application.)

Box No. VI PRIORITY CLAIM AND DOCUMENT

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application *(day/month/year)*	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1)				
item (2)				
item (3)				

☐ Further priority claims are indicated in the Supplemental Box.

Furnishing the priority document(s):

☐ The **receiving Office** is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application(s) was filed with the receiving Office which, for the purposes of this international application, is the receiving Office)* identified above as:

☐ all items ☐ item (1) ☐ item (2) ☐ item (3) ☐ other, see Supplemental Box

☐ The **International Bureau** is requested to obtain from a digital library a certified copy of the earlier application(s) identified above, using, where applicable, the access code(s) indicated below *(if the earlier application(s) is available to it from a digital library)*:

☐ item (1) access code _____ ☐ item (2) access code _____ ☐ item (3) access code _____ ☐ other, see Supplemental Box

Restore the right of priority: the receiving Office is requested to restore the right of priority for the earlier application(s) identified above or in the Supplemental Box as item(s) (_____). *(See also the Notes to Box No. VI; further information **must** be provided to support a request to restore the right of priority.)*

Incorporation by reference: where an element of the international application referred to in Article 11(1)(iii)(d) or (e) or a part of the description, claims or drawings referred to in Rule 20.5(a) is not otherwise contained in this international application but is completely contained in an earlier application whose priority is claimed on the date on which one or more elements referred to in Article 11(1)(iii) were first received by the receiving Office, that element or part is, subject to confirmation under Rule 20.6, incorporated by reference in this international application for the purposes of Rule 20.6.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if more than one International Searching Authority is competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)*:

ISA/ US

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Sheet No. 4

Box No. IX **CHECK LIST for EFS-Web filings** - this sheet is only to be used when filing an international application with RO/US via **EFS-Web**

This international application **contains** the following:	Number of sheets
(a) request form PCT/RO/101 (including any declarations and supplemental sheets)	4
(b) description (excluding any sequence listing part of the description, see (f), below)	16* ~~17~~**
(c) claims	5* ~~4~~**
(d) abstract	1
(e) drawings (if any)	6
(f) sequence listing part of the description in the form of an **image file** (e.g. PDF)	
Total number of sheets (including the sequence listing part of the description if **filed as an image file**)	32

(g) sequence listing part of the description

- ☐ filed in the form of an **Annex C/ST.25 text file**
- ☐ WILL BE filed separately on physical data carrier(s), on the same day and in the form of an **Annex C/ST.25 text file**

Indicate type and number of physical data carrier(s)

This international application is **accompanied by** the following item(s) *(mark the applicable check-boxes below and indicate in right column the number of each item):*	Number of items
1. ☒ fee calculation sheet	1
2. ☐ original separate power of attorney	
3. ☐ original general power of attorney	
4. ☐ copy of general power of attorney; reference number:	
5. ☐ priority document(s) identified in Box No. VI as item(s)	
6. ☐ Translation of international application into *(language)*:	
7. ☐ separate indications concerning deposited microorganism or other biological material	
8. ☐ *(only where item (f) is marked in the left column)* copy of the sequence listing in electronic form (Annex C/ST.25 text file) not forming part of the international application but **furnished only for the purposes of international search** under Rule 13*ter*	
9. ☐ *(only where item (f) is marked in the left column)* a statement confirming that "the information recorded in electronic form submitted under Rule 13*ter* is identical to the sequence listing as contained in the international application" as filed via EFS-Web:	
10. ☐ copy of results of earlier search(es) (Rule 12*bis*.1(a))	
11. ☐ other *(specify)*:	

Figure of the drawings which should accompany the abstract: 1

Language of filing of the international application: English

Box No. X **SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE**

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

/David S. Lee/ David S. Lee, Reg. No.: 38,222 - Patent Attorney for Applicant

21-11-2012

For receiving Office use only

1. Date of actual receipt of the purported international application: 21 NOVEMBER 2012
2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
4. Date of timely receipt of the required corrections under PCT Article 11(2):
5. International Searching Authority (if two or more are competent): ISA / US
6. ☐ Transmittal of search copy delayed until search fee is paid

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

RO/US DELETED RO/US**

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PTO-1390 (03-13)
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TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A SUBMISSION UNDER 35 U.S.C. 371

Attorney Docket No.	
2582.737BS	
U.S. Application No. (if known, see 37 CFR 1.5)	

International Application No.	International Filing Date	Priority Date Claimed
PCT/US12/66306	November 21, 2012	

Title of Invention
SCHEMES FOR CONNECTING TO WIRELESS NETWORKS

First Named Inventor
Hyoung-Gon LEE

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information.

1. ☑ This is an express request to begin national examination procedures (35 U.S.C. 371(f)). NOTE: The express request under 35 U.S.C. 371(f) will not be effective unless the requirements under 35 U.S.C. 371(c)(1), (2), and (4) for payment of the basic national fee, copy of the International Application and English translation thereof (if required), and the oath or declaration of the inventor(s) have been received.
2. ☐ A copy of the International Application (35 U.S.C. 371(c)(2)) is attached hereto (not required if the International Application was previously communicated by the International Bureau or was filed in the United States Receiving Office (RO/US)).
3. An English language translation of the International Application (35 U.S.C. 371(c)(2))
   a. ☐ is attached hereto.
   b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4).
4. An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4))
   a. ☑ is attached.
   b. ☐ was previously filed in the international phase under PCT Rule 4.17(iv).

Items 5 to 8 below concern amendments made in the international phase.

PCT Article 19 and 34 amendments

5. ☐ Amendments to the claims under PCT Article 19 are attached (not required if communicated by the International Bureau) (35 U.S.C. 371(c)(3)).
6. ☐ English translation of the PCT Article 19 amendment is attached (35 U.S.C. 371(c)(3)).
7. ☐ English translation of annexes (Article 19 and/or 34 amendments only) of the International Preliminary Examination Report is attached (35 U.S.C. 371(c)(5)).

Cancellation of amendments made in the international phase

8a. ☐ Do not enter the amendment made in the international phase under PCT Article 19.

8b. ☐ Do not enter the amendment made in the international phase under PCT Article 34.

NOTE: A proper amendment made in English under Article 19 or 34 will be entered in the U.S. national phase application absent a clear instruction from applicant not to enter the amendment(s).

The following items 9 to 17 concern a document(s) or information included.

9. ☑ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
10. ☐ A preliminary amendment.
11. ☑ An Application Data Sheet under 37 CFR 1.76.
12. ☐ A substitute specification. NOTE: A substitute specification cannot include claims. See 37 CFR 1.125(b).
13. ☑ A power of attorney and/or change of address letter.
14. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13*ter*.3 and 37 CFR 1.821-1.825.
15. ☐ Assignment papers *(cover sheet and document(s))*. Name of Assignee: _____
16. ☑ 37 CFR 3.73(c) Statement *(when there is an Assignee)*.

This collection of information is required by 37 CFR 1.414 and 1.491-1.492. The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 15 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

U.S. APPLN. No. (if known – see 37 CFR 1.5)	INTERNATIONAL APPLICATION No.	ATTORNEY DOCKET No.
	PCT/US12/66306	2582.737BS

17. ☑ Other items or information:

International Search Report with Cited references

The following fees have been submitted.	CALCULATIONS	PTO USE ONLY
18. ☑ Basic national fee (37 CFR 1.492(a)) **$280**	$ 280.00	
19. ☑ Examination fee (37 CFR 1.492(c)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** All other situations **$720**	720.00 $	
20. ☑ Search fee (37 CFR 1.492(b)) If the written opinion prepared by ISA/US or the international preliminary examination report prepared by IPEA/US indicates all claims satisfy provisions of PCT Article 33(1)-(4) ..... **$0** Search fee (37 CFR 1.445(a)(2)) has been paid on the international application to the USPTO as an International Searching Authority .....**$120** International Search Report prepared by an ISA other than the US and provided to the Office or previously communicated to the US by the IB .....**$480** All other situations **$600**	120.00 $	
TOTAL OF 18, 19, and 20 =	$ 1120.00	
☐ Additional fee for specification and drawings filed in paper over 100 sheets (excluding sequence listing in compliance with 37 CFR 1.821(c) or (e) in an electronic medium or computer program listing in an electronic medium) (37 CFR 1.492(j)). Fee for each additional 50 sheets of paper or fraction thereof **$400**		

Total Sheets	Extra Sheets	Number of each addition 50 or fraction thereof (round **up** to a whole number)	RATE	
28 - 100 =	/ 50 =	0	x **$400**	$
Surcharge of **$140.00** for furnishing any of the search fee, examination fee, or the oath or declaration after the date of commencement of the national stage (37 CFR 1.492(h)).				$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	24 - 20 =	4	x **$80**	$ 320.00
Independent claims	3 - 3 =	0	x **$420**	$ 0.00
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			**+ $780**	$
Processing fee of **$140.00** for furnishing the English translation later than 30 months from the earliest claimed priority date (37 CFR 1.492(i)). +				$
TOTAL OF ABOVE CALCULATIONS =				$ 1440.00
☐ **Applicant asserts small entity status.** See 37 CFR 1.27. Fees above are reduced by ½.				
☐ **Applicant certifies micro entity status.** See 37 CFR 1.29. Fees above are reduced by ¾. Applicant must attach form PTO/SB/15A or B or equivalent.				
TOTAL NATIONAL FEE =				$ 1440.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property. +				$
TOTAL FEES ENCLOSED =				$ 1440.00
			Amount to be refunded:	$
			Amount to be charged:	$

a. ☐ A check in the amount of $_____ to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account No. _____ in the amount of $_____ to cover the above fees.

c. ☑ The Director is hereby authorized to charge additional fees which may be required, or credit any overpayment, to Deposit Account No. 50-4888 as follows:

i. ☑ any required fee.

ii. ☐ any required fee except for excess claims fees required under 37 CFR 1.492(d) and (e) and multiple dependent claim fee required under 37 CFR 1.492(f).

d. ☑ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038. The PTO-2038 should only be mailed or faxed to the USPTO. However, when paying the basic national fee, the PTO-2038 may NOT be faxed to the USPTO.

ADVISORY: If filing by EFS-Web, do **NOT** attach the PTO-2038 form as a PDF along with your EFS-Web submission. Please be advised that this is **not** recommended and by doing so your **credit card information may be displayed via PAIR**. To protect your information, it is recommended to pay fees online by using the electronic payment method.

NOTE: Where an appropriate time limit under 37 CFR 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the International Application to pending status.

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File)Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013, and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: A U.S. national stage application may not claim priority to the international application of which it is the national phase. The filing date of a U.S. national stage application is the international filing date. See 35 U.S.C. 363.

Correspondence Address

☑ The address associated with Customer Number: 86636 **OR** ☐ Correspondence address below

Name					
Address					
City		State		Zip Code	
Country		Telephone			
Email					

Signature	/David S. Lee/	Date	May 16, 2013
Name (Print/Type)	David S. Lee	Registration No. (Attorney/Agent)	38222

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/96 (06-09)
Approved for use through 07/31/2009. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Empire Technology Development LLC

Application No./Patent No.: Not yet assigned Filed/Issue Date: on even date herewith

Titled: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

Empire Technology Development LLC , a Limited Liability Company

(Name of Assignee) (Type of Assignee, e.g., corporation, partnership, university, government agency, etc.

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;

2. ☐ an assignee of less than the entire right, title, and interest in (The extent (by percentage) of its ownership interest is _____ %); or

3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 029343, Frame 0123, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☒ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (*i.e.*, a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/David S. Lee/ May 16, 2013

Signature Date

David S. Lee, Reg No.: 38,222 Patent Attorney for Applicant

Printed or Typed Name Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/SB/80 (11-08)
Approved for use through 11/30/2011. OMB 0651-0035
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☑ Practitioners associated with the Customer Number: 86636

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☑ The address associated with Customer Number: 86636

OR

☐ Firm or Individual Name			
Address			
City		State	Zip
Country			
Telephone		Email	

Assignee Name and Address:

Empire Technology Development LLC
2711 Centerville Road, Suite 400
Wilmington, Delaware 19808

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature			Date 12-9-2011
Name		JEROME HEWLETT	Telephone
Title		authorized person	

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

PTO/AIA/01 (06-12)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK

As the below named inventor, I hereby declare that:

This declaration is directed to:

☐ The attached application, or

☒ United States application or PCT international application number PCT/US12/66306 filed on 11/21/2012.

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available.

LEGAL NAME OF INVENTOR

Inventor: Hyoung-Gon Lee Date (Optional): APR. 26, 2013

Signature: [signature]

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 1 minute to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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

PTO/SB/08a (01-10)
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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2013-05-16
First Named Inventor	Lee, Hyoung-Gon
Art Unit	
Examiner Name	
Attorney Docket Number	2582.737BS

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7808958	B1	2010-10-05	Hernacki et al	
	2	7185204	B2	2007-02-27	Narayanaswami et al	
	3	8005458	B2	2011-08-23	Baik et al	

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

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080052779	A1	2008-02-28	Sinha et al	
	2	20110083165	A1	2011-04-07	Gopinath et al	
	3	20110314147	A1	2011-12-22	Whelan et al	

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

	4	20080043686	A1	2008-02-21	Sperti et al	
	5	20070286143	A1	2007-12-13	Olson et al	
	6	20030221006	A1	2003-11-27	Kuan et al	
	7	20120221955	A1	2012-08-30	Raleigh et al	

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

FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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

NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report from International Application No.: PCT/US12/66306 mailed Feb. 8, 2013.	☐
	2	Singelee, et al., "Enabling Location Privacy in Wireless Personal Area Networks", 20 pages, 2006.	☐

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

	3	Gruteser, et al., "Enhancing Location Privacy in Wireless LAN Through Disposable Interface Identifiers: A Quantitative Analysis", Sept. 19, 2003, 10 pages.	☐

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

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

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

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

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/David S. Lee/	Date (YYYY-MM-DD)	2013-05-16
Name/Print	David S. Lee	Registration Number	38222

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

Privacy Act Statement

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

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

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

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

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

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

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

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

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

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

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

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To:
DAVID S. LEE
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT AND THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY, OR THE DECLARATION

(PCT Rule 44.1)

Date of mailing *(day/month/year)*	08 FEB 2013
Applicant's or agent's file reference 2582PCT.737BS	**FOR FURTHER ACTION** See paragraphs 1 and 4 below
International application No. PCT/US 12/66306	International filing date *(day/month/year)* 21 November 2012 (21.11.2012)
Applicant EMPIRE TECHNOLOGY DEVELOPMENT	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

   When? The time limit for filing such amendments is normally two months from the date of transmittal of the international search report.

   Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes 1211 Geneva 20, Switzerland, Facsimile No.: +41 22 338 82 70

   For more detailed instructions, see *PCT Applicant's Guide*, International Phase, paragraphs 9.004 – 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with any request to forward the texts of both the protest and the decision thereon to the designated Offices.

   ☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**

   The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

   Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before the completion of the technical preparations for international publication (Rules 90*bis*.1 and 90*bis*.3).

   Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

   In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

   For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide*, National Chapters.

Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer Lee W. Young PCT Helpdesk: 571-272-4300 Telephone No. PCT OSP: 571-272-7774

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 2582PCT.737BS	**FOR FURTHER ACTION**	see Form PCT/ISA/220 as well as, where applicable, item 5 below.
International application No. PCT/US 12/66306	International filing date *(day/month/year)* 21 November 2012 (21.11.2012)	(Earliest) Priority Date *(day/month/year)*
Applicant EMPIRE TECHNOLOGY DEVELOPMENT		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of:

☒ the international application in the language in which it was filed.

☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6*bis*(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (see Box No. II).

3. ☐ **Unity of invention is lacking** (see Box No. III).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2, by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. With regard to the **drawings**,

a. the figure of the **drawings** to be published with the abstract is Figure No. 1

☒ as suggested by the applicant.

☐ as selected by this Authority, because the applicant failed to suggest a figure.

☐ as selected by this Authority, because this figure better characterizes the invention.

b. ☐ none of the figures is to be published with the abstract.

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 12/66306

A. CLASSIFICATION OF SUBJECT MATTER
IPC(8) - G06F 7/04 (2013.01)
USPC - 340/5.6
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
USPC: 340/5.6

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
IPC: G06F 7/04; G06Q 10/10, 30/02; H04M 11/04 (2013.01); USPC: 340/5.6; 455/404.2, 456.1, 414.2; 370/338 (keyword limited - see search terms below)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
PatBase; Google; Google Scholar
Terms: wifi, wireless, 802.11, access point, node, security, authenticate, authorize, probe, scan, beacon, request, fake, spoof, unauthorized, frame, packet, address, ssid, service, set, mac, media, access, identifier, identity, random.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2008/0052779 A1 (Sinha et al.) 28 February 2008 (28.02.2008) entire document, especially abstract, Figs. 1, 6, 9, para. [0011], [0016], [0019], [0032]-[0083]	1-6, 8-13, 15-24 --- 7, 14
Y	US 2011/0083165 A1 (Gopinath et al.) 07 April 2011 (07.04.2011) para. [0008], [0011], [0037], [0038], [0092], [0104], [0112], [0120]	7, 14
A	US 7,808,958 B1 (Hernacki et al.) 05 October 2010 (05.10.2010) entire document.	1-24
A	US 2011/0314147 A1 (Whelan et al.) 22 December 2011 (22.12.2011) ntire document.	1-24
A	US 2008/0043686 A1 (Sperti et al.) 21 February 2008 (21.02.2008) entire document.	1-24
A	US 2007/0286143 A1 (Olson et al.) 13 December 2007 (13.12.2007) entire document.	1-24
A	US 2003/0221006 A1 (Kuan et al.) 27 November 2003 (27.11.2003) entire document.	1-24
A	US 2012/0221955 A1 (Raleigh et al.) 30 August 2012 (30.08.2012) entire document.	1-24

☐ Further documents are listed in the continuation of Box C. ☐

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
18 January 2013 (18.01.2013)	08 FEB 2013
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (July 2009)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To: DAVID S. LEE
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

Date of mailing *(day/month/year)*	08 FEB 2013
Applicant's or agent's file reference 2582PCT.737BS	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US 12/66306	21 November 2012 (21.11.2012)	

International Patent Classification (IPC) or both national classification and IPC
IPC(8) - G06F 7/04 (2013.01)
USPC - 340/5.6

Applicant EMPIRE TECHNOLOGY DEVELOPMENT

1. This opinion contains indications relating to the following items:

- [X] Box No. I Basis of the opinion
- [ ] Box No. II Priority
- [ ] Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- [ ] Box No. IV Lack of unity of invention
- [X] Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- [ ] Box No. VI Certain documents cited
- [ ] Box No. VII Certain defects in the international application
- [ ] Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1 *bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

Name and mailing address of the ISA/US	Date of completion of this opinion	Authorized officer:
Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	18 January 2013 (18.01.2013)	Lee W. Young PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/237 (cover sheet) (July 2011)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 12/66306

Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed.

   ☐ a translation of the international application into _____ which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:

   a. (means)

   ☐ on paper

   ☐ in electronic form

   b. (time)

   ☐ in the international application as filed

   ☐ together with the international application in electronic form

   ☐ subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 12/66306

Box No. V **Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	7, 14	YES
	Claims	1-6, 8-13, 15-24	NO
Inventive step (IS)	Claims	None	YES
	Claims	1-24	NO
Industrial applicability (IA)	Claims	1-24	YES
	Claims	None	NO

2. Citations and explanations:

Claims 1-6, 8-13, and 15-24 lack novelty under PCT Article 33(2) as being anticipated by US 2008/0052779 A1 to Sinha et al. (hereinafter Sinha).

Regarding claim 1, Sinha teaches a method performed under control of an end device (wireless client devices 425; APs 405 and/or clients 425 can occasionally operate as sensors 601 and communicate data, events, and statistics to the server(s) 602, para. [0061], [0068]), comprising: transmitting, to an access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), a probe request frame (send out probe request frames to seek out other IEEE 802.11 devices available for association, para. [0034]) including a fake device identifier for the end device (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9); receiving, from the access point (AP 405), a probe response frame (injection protection can create random frames and transmit the random frames obscure the real frames; AP transmits random frames C, D among the transmission of frames 8 through 14, para. [0078], [0082], [0083]) including information regarding the access point (transmission of frames 1 through 7, para. [0075], [0082], [0083]); determining whether the access point (AP 405/sensor 601) is an authenticated access point based at least in part on the information regarding the access point (clients 425-3, 425-4 can filter out and ignore the random, fake frames, para. [0082]); and transmitting, to the access point, a connection request including an authentic device identifier (Client 425-3 transmits frames 1 through 7 to an AP 405, para. [0082]) for the end device (deauthentication frames and disassociation frames are exchanged during normal wireless roaming and association between a station and an access point, para. [0063], [0065]).

Regarding claim 2, Sinha further teaches receiving, from the access point, an approval of the connection request (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]); and connecting to a wireless local area network provided by the access point (network 401 can include an internet protocol (IP) network. The wireless network 400 includes multiple wireless client devices 425 operable to connect to the AP 405 through a wireless link. Wireless client devices 425 can include laptop and desktop computers as well as other wireless-enable devices, para. [0061]).

Regarding claim 3, Sinha further teaches wherein the access point includes a Wi-Fi access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), and the wireless local area network provided by the access point includes a Wi-Fi network (IEEE 802.11 network, para. [0039]).

Regarding claim 4, Sinha further teaches wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device (WLAN network 600 equipped with sensors 601 and server(s) 602, para. [0067], Fig. 6).

Regarding claim 5, Sinha further teaches generating the fake device identifier before transmitting the probe request frame (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9).

Regarding claim 6, Sinha further teaches receiving the fake device identifier from a mobile operating server (sensor 601/access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9) before transmitting the probe request frame (initial handshake between the device and AP by simulating fake handshakes when the real devices are already connected with proper handshakes, para. [0075]).

Regarding claim 8, Sinha further teaches wherein the authentic device identifier includes a media access control (MAC) address (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]).

Regarding claim 9, Sinha further teaches receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 12/66306

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 10, Sinha further teaches wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]), and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Regarding claim 11, Sinha teaches an end device (wireless client devices 425, para. [0061]), comprising:
a transmitting unit configured to transmit, to an access point (APs 405 and/or clients 425 can occasionally operate as sensors 601 and communicate data, events, and statistics to the server(s) 602, para. [0068], Fig. 1, 9),
a probe request frame (send out probe request frames to seek out other IEEE 802.11 devices available for association, para. [0034]) including
a fake device identifier (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9);
a receiving unit (clients 425) configured to receive, from the access point, a probe response frame (injection protection can create random frames and transmit the random frames obscure the real frames; AP transmits random frames C, D among the transmission of frames 8 through 14, para. [0078], [0082], [0083]) including information regarding the access point (transmission of frames 1 through 7, para. [0075], [0082], [0083]);
a memory configured to store an authenticated access point list including information regarding at least one authenticated access point (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]);
a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list (clients 425-3, 425-4 can filter out and ignore the random, fake frames, para. [0082]); and
a connecting unit configured to connect to a wireless local area network provided by the access point (offering a wireless connection to the Internet, para. [0038]),
wherein the transmitting unit is further configured to transmit, to the access point a connection request including an authentic device identifier (Client 425-3 transmits frames 1 through 7 to an AP 405, para. [0082]), and
the receiving unit is further configured to receive, from the access point, an approval of the connection request (deauthentication frames and disassociation frames are exchanged during normal wireless roaming and association between a station and an access point, para. [0063], [0065]).

Regarding claim 12, Sinha further teaches a fake device identifier generating unit configured to generate the fake device identifier (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9).

RRegarding claim 13, Sinha further teaches wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server (sensor 601/access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420; WLAN network 600 equipped with sensors 601 and server(s) 602, para. [0061], [0067], Fig. 1, 6, 9).

Regarding claim 15, Sinha further teaches wherein the authentic device identifier includes a media access control (MAC) address (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]).

Regarding claim 16, Sinha further teaches wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Regarding claim 17, Sinha further teaches wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]), and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Regarding claim 18, Sinha further teaches wherein the access point includes a Wi-Fi access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), and the wireless local area network provided by the access point includes a Wi-Fi network (IEEE 802.11 network, para. [0039]).

Regarding claim 19, Sinha further teaches wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device (WLAN network 600 equipped with sensors 601 and server(s) 602, para. [0067], Fig. 6).

---continued in supplemental box---

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US 12/66306

Supplemental Box

In case **the space in any of the preceding boxes is not sufficient.**
Continuation of:
Box No. V.2. Citations and explanations.

Regarding claim 20, Sinha teaches a computer-readable storage medium having stored thereon computer-executable instructions that (computer-readable media including computer storage mechanisms, para. [0086]), in response to execution, cause an end device to perform operations (wireless client devices 425; APs 405 and/or clients 425 can occasionally operate as sensors 601 and communicate data, events, and statistics to the server(s) 602, para. [0061], [0068]), comprising: transmitting, to an access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), a probe request frame (send out probe request frames to seek out other IEEE 802.11 devices available for association, para. [0034]) including a fake device identifier of the end device (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9); receiving, from the access point (AP 405), a probe response frame (injection protection can create random frames and transmit the random frames obscure the real frames; AP transmits random frames C, D among the transmission of frames 8 through 14, para. [0078], [0082], [0083]) including information regarding the access point (transmission of frames 1 through 7, para. [0075], [0082], [0083]); determining whether the access point (AP 405/sensor 601) is an authenticated access point based at least in part regarding the information regarding the access point (clients 425-3, 425-4 can filter out and ignore the random, fake frames, para. [0082]); and transmitting, to the access point, a connection request including an authentic device identifier (Client 425-3 transmits frames 1 through 7 to an AP 405, para. [0082]) of the end device (deauthentication frames and disassociation frames are exchanged during normal wireless roaming and association between a station and an access point, para. [0063], [0065]).

Regarding claim 21, Sinha further teaches wherein the operations further comprise: receiving, from the access point, an approval of the connection (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]); and connecting to a wireless local area network provided by the access point (network 401 can include an internet protocol (IP) network. The wireless network 400 includes multiple wireless client devices 425 operable to connect to the AP 405 through a wireless link. Wireless client devices 425 can include laptop and desktop computers as well as other wireless-enable devices, para. [0061]).

Regarding claim 22, Sinha further teaches wherein the operations further comprise: generating the fake device identifier (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9).

Regarding claim 23, Sinha further teaches wherein the authentic device identifier includes a media access control (MAC) address (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]).

Regarding claim 24, Sinha further teaches wherein the access point includes a Wi-Fi access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), and the wireless local area network provided by the access point includes a Wi-Fi network (IEEE 802.11 network, para. [0039]).

Claims 7 and 14 lack an inventive step under PCT Article 33(3) as being obvious over Sinha in view of US 2011/0083165 A1 to Gopinath et al. (hereinafter Gopinath).

Regarding claim 7, Sinha teaches the elements of claim 1. Sinha does not expressly teach wherein the fake device identifier includes at least one of a random number or a random character. However Gopinath, in an analogous art, teaches wherein the fake device identifier (fake beacon packets from the sniffer with the AP's address as the source address, para. [0120]) includes at least one of a random number or a random character (ACK collision can be inflicted by a number of ways including, but not limited to, transmitting misformed ACK packet or ACK packet with random bits, para. [0112]). It would have been obvious to one skilled in the art to combine the teachings of Sinha with those of Gopinath in order to further secure the wireless network protection system of Sinha with geographical detection (see Gopinath para. [0008], [0011]).

Regarding claim 14, Sinha teaches the elements of claim 11. Sinha does not expressly teach wherein the fake device identifier includes at least one of a random number or a random character. However Gopinath, in an analogous art, teaches wherein the fake device identifier includes at least one of a random number or a random character (fake beacon packets from the sniffer with the AP's address as the source address, para. [0120]) includes at least one of a random number or a random character (ACK collision can be inflicted by a number of ways including, but not limited to, transmitting misformed ACK packet or ACK packet with random bits, para. [0112]). It would have been obvious to one skilled in the art to combine the teachings of Sinha with those of Gopinath in order to further secure the wireless network protection system of Sinha with geographical detection (see Gopinath para. [0008], [0011]).

Claims 1-24 have industrial applicability as defined by PCT Article 33(4) because the subject matter can be made or used in industry.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2582.737BS
	Application Number	
Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
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Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Hyoung-Gon		LEE	

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

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Postal Code	135-850	**Country** i	KR

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Customer Number	86636		
Email Address	dlee@brundidge-stanger.com	Add Email	Remove Email

Application Information:

Title of the Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK		
Attorney Docket Number	2582.737BS	**Small Entity Status Claimed**	☐
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	6	**Suggested Figure for Publication (if any)**	

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2582.737BS
	Application Number	
Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

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Prefix	**Given Name**	Middle Name	**Family Name**	Suffix	
	David	S	Lee		Remove

Registration Number	38222

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Prior Application Status	Pending		Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	a 371 of international	PCT/US12/66306	2012-11-21

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2582.737BS
	Application Number	
Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code [i] (if applicable)

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2582.737BS
	Application Number	
Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

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(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

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Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

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Country [i]	US	Postal Code	19808
Phone Number		Fax Number	
Email Address			

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	2582.737BS
	Application Number	
Title of Invention	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

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Signature	/David S. Lee/			Date (YYYY-MM-DD)	2013-05-16
First Name	David	Last Name	Lee	Registration Number	38222

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Application Number:	
Filing Date:	
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORKS
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Filer:	David S. Lee/Nora Colston
Attorney Docket Number:	2582.737BS

Filed as Large Entity

U.S. National Stage under 35 USC 371 Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
National Stage Fee	1631	1	280	280
Natl Stage Search Fee - U.S. was the ISA	1641	1	120	120
National Stage Exam - all other cases	1633	1	720	720
Pages:				
Claims:				
Claims in excess of 20	1615	4	80	320
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**1440**

Electronic Acknowledgement Receipt

EFS ID:	15792520
Application Number:	13885754
International Application Number:	PCT/US12/66306
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORKS
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	David S. Lee/Nora Colston
Filer Authorized By:	David S. Lee
Attorney Docket Number:	2582.737BS
Receipt Date:	16-MAY-2013
Filing Date:	
Time Stamp:	12:32:43
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$1440
RAM confirmation Number	10790
Deposit Account	504888
Authorized User	LEE, DAVID S.

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1	Transmittal of New Application	2582_371Transmittal.pdf	219616 26bb154d8da9b9e58df29dd2f52b281918540c28	no	4
Warnings:					
Information:					
2	Assignee showing of ownership per 37 CFR 3.73.	2582_373statement.pdf	425721 217f68237bcd8085b66f52872c0dc73884f660fd	no	2
Warnings:					
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3	Power of Attorney	2582_GPOA.pdf	133176 3f92c3c78141763e307d737f20b64e7914421616	no	1
Warnings:					
Information:					
4	Oath or Declaration filed	2582_Declaration.pdf	796050 da814e05b1c9f44d4b782d71f40882b234802071	no	1
Warnings:					
Information:					
5	Information Disclosure Statement (IDS) Form (SB08)	2582_IDS.pdf	612882 a9ff3bb83a5678ff4e9a41da11daeddd59945655	no	5
Warnings:					
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6	Documents submitted with 371 Applications	2582_ISRWO.pdf	499798 863415b5f56d423f4f2301eb2a244846938ed56a	no	8
Warnings:					
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7	Non Patent Literature	2582_Gruteser_NPL.pdf	285089 caa98c86d9e70b7e8bb94c62631677c4f3894dd0	no	10
Warnings:					
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8	Non Patent Literature	2582_Singelee_NPL.pdf	178409 ad2534656ec75ad22b79529b96f08029c2b4d43b	no	19

Warnings:					
Information:					
9	Application Data Sheet	2582_ADS.pdf	1503561 06c306f6daf49a990472b676459c05a6a3c98f4d	no	6
Warnings:					
Information:					
10	Fee Worksheet (SB06)	fee-info.pdf	36674 2fc59915d8752b4935550d55319a21905e763606	no	2
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(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
30 May 2014 (30.05.2014)

WIPO | PCT

(10) International Publication Number
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(51) International Patent Classification:
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21 November 2012 (21.11.2012)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant: **EMPIRE TECHNOLOGY DEVELOPMENT** [US/US]; 2711 Centerville Road, Suite 400, Wilmington, DE 19808 (US).

(72) Inventor: **LEE, Hyoung-Gon**; 101-705, Daechi Hyundai Apt. 974, Daechi 2-dong, Gangnam-gu, Seoul 135-850 (KR).

(74) Agent: **LEE, David, S.**; Brundidge & Stanger, P.C., 2318 Mill Road, Suite 1020, Alexandria, VA 22314 (US).

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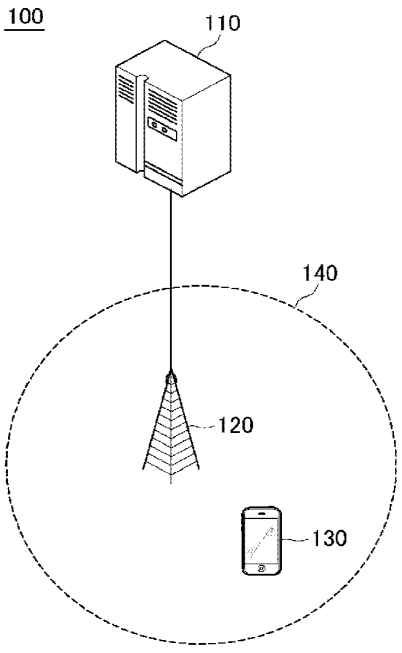
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

(57) Abstract: Technologies are generally described for connecting to a wireless local area network. In some examples, a method performed under control of an end device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

FIG. 1



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SCHEMES FOR CONNECTING TO WIRELESS NETWORK

BACKGROUND

[0001] The availability of third generation (3G) and fourth generation (4G) mobile telecommunications technologies, and Wi-Fi wireless access technologies make it possible to provide wireless data communications. It is generally preferable to use Wi-Fi networks for data transmission because Wi-Fi wireless access technologies are typically available at lower cost but with higher throughput than the third generation (3G) and/or fourth generation (4G) mobile telecommunications technologies. However, security for Wi-Fi wireless access technologies has drawn intense scrutiny.

SUMMARY

[0002] In an example, a method performed under control of an end device first device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

[0003] In another example, an end device may include a transmitting unit configured to transmit a probe request frame including a fake device identifier to an access point, a receiving unit configured to receive a probe response frame including information regarding the access point from the access point, a memory configured to store an authenticated access point list including information regarding at least one authenticated access point, a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list, and a connecting unit configured to connect to a wireless local area network provided by the access point. The transmitting unit is further

configured to transmit a connection request including an original device identifier to the access point, and the receiving unit is further configured to receive an approval of the connection request from the access point.

[0004] In yet another example, a computer-readable storage medium may store thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, including transmitting a probe request frame including a fake device identifier of the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and transmitting a connection request including an original device identifier of the end device to the access point.

[0005] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

[0006] The foregoing and other features of this disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. With the understanding that these drawings depict only several embodiments in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[0007] **Fig. 1** schematically shows an illustrative example of a network communications environment including a mobile operating server, an access point and an end device, arranged in accordance with at least some embodiments described herein;

[0008] **Fig. 2** schematically shows an illustrative example of an authenticated access point list, arranged in accordance with at least some embodiments described herein;

[0009] **Fig. 3** shows an example flow diagram of a process of an end device for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein;

[0010] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device, arranged in accordance with at least some embodiments described herein;

[0011] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein; and

[0012] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0014] This disclosure is generally drawn, *inter alia*, to methods, apparatuses, systems, devices, and computer program products related to secured wireless network communication schemes.

[0015] Technologies are generally described for connecting to wireless networks while preventing leakage of location information of an end device.

[0016] In general, in order to connect to a wireless local area network (WLAN), an end device may search for at least one available access point around the end device. By way of example, but not limitation, the access point may be a Wi-Fi access point and the WLAN may be a Wi-Fi network. When searching, the

end device may transmit a probe request frame that may include a device identifier, for the end device such as a media access control (MAC) address of the end device. In such cases, since the probe request frame that includes the device identifier is transmitted to access points around the end device, present location information of the end device may be exposed to some access points with which a user of the end device does not want to be connected and/or other devices to which the end device does not want to disclose the present location information.

[0017] In some embodiments, an end device may transmit a probe request frame that includes a fake device identifier for the end device to at least one access point around the end device. As a response to the probe request frame, the end device may receive a probe response frame from one or more access points. The probe response frame may include information regarding the access point. By way of example, but not limitation, the information regarding the access point may include a MAC address of the access point and/or a service set identifier (SSID) of the access point.

[0018] The end device may determine whether there is an authenticated access point around the end device based at least in part on the information included in the probe response frame. If there is an authenticated access point around the end device, the end device may transmit a connection request including an authentic device identifier for the end device, such as an original MAC address, to the authenticated access point. Then, the end device may connect to a wireless local area network provided by the authenticated access point without a leakage of present location information of the end device to undesirable access points.

[0019] **Fig. 1** schematically shows an illustrative example of a network communications environment 100 including a mobile operating server, an access point, and an end device, arranged in accordance with at least some embodiments described herein.

[0020] As illustrated in Fig. 1, network communications environment 100 may include a mobile operating server 110, an access point 120 and an end device 130. Mobile operating server 110 may control access point 120. In Fig 1, although only one access point (i.e., access point 120) is located around end device 130, so that end device 130 is located in a network area 140 provided by access point 120, there could be two or more access points around end device 130.

[0021] By way of example, access point 120 may include a Wi-Fi access point and provide a WLAN that includes a Wi-Fi network. Further, by way of example, end device 130 may include, but not exclusively, a personal communication terminal, such as PCS (Personal Communication System), GMS (Global System for Mobile communications), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), PDA (Personal Digital Assistant), IMT (International Mobile Telecommunication)-2000, CDMA (Code Division Multiple Access)-2000, W-CDMA (W-Code Division Multiple Access) and Wibro (Wireless Broadband Internet) terminals.

[0022] End device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include one or both of one or more random numbers or one or more random characters. In some embodiments, end device 130 may generate the fake device identifier and transmit the generated fake device identifier to access point 120. Further, in some other embodiments, mobile operating server 110 may provide end device 130 with the fake device identifier, and end device 130 may transmit the provided fake device identifier to access point 120.

[0023] End device 130 may receive a probe response frame from access point 120 to which end device 130 transmitted the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0024] End device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, end device 130 may receive an authenticated access point list including information regarding at least one authenticated access point from mobile operating server 110. End device 130 may determine whether access point 120 is an authenticated access point based at least in part on the authenticated access point list. By way of example, end device 130 may check whether the information regarding access point 120 is included in the authenticated access

point list. If the information regarding access point 120 is included in the authenticated access point list, end device 130 may recognize access point 120 as an authenticated access point. By way of example, but not limitation, the authenticated access point may include an access point controlled by mobile operating server 110 and/or an access point previously connected with end device 130.

[0025] **Fig. 2** schematically shows an illustrative example of an authenticated access point list 200, arranged in accordance with at least some embodiments described herein. As illustrated in Fig. 2, authenticated access point list 200 may include the information regarding at least one authenticated access point. By way of example, but not limitation, the information regarding the least one authenticated access point may include a MAC address or an SSID of each authenticated access point.

[0026] Referring back to Fig. 1, end device 130 may transmit a connection request, including an authentic device identifier, to authenticated access point 120 for end device 130. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130. In some embodiments, the connection request may include an authentication request for authenticated access point 120 to authenticate end device 130. Further, the authentication request may include a shared key between access point 120 and end device 130.

[0027] End device 130 may receive an approval of the connection request from access point 120. In some embodiments, the approval of the connection request may include an authentication response.

[0028] End device 130 may transmit an association request to access point 120 in response to the approval of the connection request and, in response to the association request, access point 120 may transmit an association response to end device 130. Then, end device 130 may connect to the wireless local area network provided by access point 120.

[0029] **Fig. 3** shows an example flow diagram of a process 300 of an end device 130 for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. The method in Fig. 3 may be implemented in the network communication environment including mobile

operating server 110, access point 120 and end device 130, as illustrated in Fig. 1. An example process may include one or more operations, actions, or functions as illustrated by one or more blocks 310, 320, 330, 340, 350 and/or 360. Although illustrated as discrete blocks, various blocks may be divided into additional blocks, combined into fewer blocks, or eliminated, depending on the desired implementation. Processing may begin at block 310.

[0030] At block 310 (Transmit Probe Request Frame), end device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include at least one of a random number or a random character. Processing may proceed from block 310 to block 320.

[0031] At block 320 (Receive Probe Response Frame), end device 130 may receive a probe response frame from access point 120 as a response to the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120. Processing may proceed from block 320 to block 330.

[0032] At block 330 (Determine Whether Access Point is Authenticated Access Point), end device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120 included in the probe response frame. In some embodiments, end device 130 may receive authenticated access point list 200, as illustrated in Fig. 2, from mobile operating server 110. Authenticated access point list 200 may include information regarding at least one authenticated access point.

[0033] At block 330, end device 130 may check whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point. Processing may proceed from block 330 to block 340.

[0034] At block 340 (Transmit Connection Request), end device 130 may transmit a connection request including an authentic device identifier for end device 130 to access point 120 which is recognized as the authenticated access point at block 330. By way of example, but not limitation, the authentic device identifier may include an origianl MAC address of end device 130. Processing may proceed from block 340 to block 350.

[0035] At block 350 (Receive Approval of Connection Request), end device 130 may receive an approval of the connection request from access point 120. Processing may proceed from block 350 to block 360.

[0036] At block 360 (Connect to Wireless Local Area Network), end device 130 may connect to a wireless local area network provided by access point 120. By way of example, but not limitation, the wireless local area network provided by access point 120 may include a Wi-Fi network.

[0037] One skilled in the art will appreciate that, for this and other processes and methods disclosed herein, the functions performed in the processes and methods may be implemented in differing order. Furthermore, the outlined steps and operations are only provided as examples, and some of the steps and operations may be optional, combined into fewer steps and operations, or expanded into additional steps and operations without detracting from the essence of the disclosed embodiments.

[0038] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device 130, arranged in accordance with at least some embodiments described herein. As depicted in Fig. 4, end device 130 may include a fake device identifier generating unit 410, a transmitting unit 420, a receiving unit 430, a determination unit 440, a memory 450, and a connecting unit 460. Although illustrated as discrete components, various components may be divided into additional components, combined into fewer components, or eliminated altogether while being contemplated within the scope of the disclosed subject matter.

[0039] Fake device identifier generating unit 410 may generate a fake device identifier (for example, a fake MAC address) for end device 130. By way of example, but not limitation, the fake device identifier may include a random number and/or a random character.

[0040] Transmitting unit 420 may transmit, to access point 120, a probe request frame which may include the fake device identifier generated by fake device identifier generating unit 410.

[0041] Receiving unit 430 may receive a probe response frame from access point 120 to which the probe request frame is transmitted. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0042] In some embodiments, receiving unit 430 may receive a fake device identifier (for example, a fake MAC address) for end device 130 from mobile operating server 110. In such cases, transmitting unit 420 may transmit, to access point 120, a probe request frame that includes the fake device identifier received from mobile operating server 110.

[0043] Determination unit 440 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, determination unit 440 may compare the information regarding access point 120, which is included in the probe response frame, and information regarding authenticated access points, which is included in authenticated access point list 200 as illustrated in Fig. 2. The information regarding the authenticated access points may include a MAC address and/or an SSID of each of the authenticated access points.

[0044] Determination unit 440 may determine whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point.

[0045] Memory 450 may store authenticated access point list 200. In some embodiments, receiving unit 430 may receive authenticated access point list 200 from mobile operating server 110 and memory 450 may store the received authenticated access point list 200. Further, memory 450 may store the fake device identifier which is generated by fake device identifier generating unit 410 or received from mobile operating server 110.

[0046] Transmitting unit 420 may transmit a connection request, which includes an authentic device identifier, for end device 130 to access point 120 that is recognized as the authenticated access point by determination unit 440. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130.

[0047] Receiving unit 430 may receive an approval of the connection request from access point 120 and connecting unit 460 may connect to a wireless local area network provided by access point 120.

[0048] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. Program product 500 may include a signal bearing medium 510. Signal bearing medium 510 may include one or more instructions 520 that, when executed by, for example, a processor, may provide the functionality described above with respect to Figs. 1-4. By way of example, instructions 520 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to Fig. 4, end device 130 may undertake one or more of the blocks shown in Fig. 3 in response to instructions 520.

[0049] In some implementations, signal bearing medium 510 may encompass a computer-readable medium 530, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium 510 may encompass a recordable medium 540, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 510 may encompass a communications medium 550, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a

wireless communication link, etc.). Thus, for example, program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 520, where the signal bearing medium 520 is conveyed by a wireless communications medium 550 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

[0050] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. In these examples, elements of computing device 600 may be arranged or configured for a mobile operating server or an end device. In a very basic configuration 602, computing device 600 typically includes one or more processors 604 and a system memory 606. A memory bus 608 may be used for communicating between processor 604 and system memory 606.

[0051] Depending on the desired configuration, processor 604 may be of any type including but not limited to a microprocessor (μP), a microcontroller (μC), a digital signal processor (DSP), or any combination thereof. Processor 604 may include one more levels of caching, such as a level one cache 610 and a level two cache 612, a processor core 614, and registers 616. An example processor core 614 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processing core (DSP Core), or any combination thereof. An example memory controller 618 may also be used with processor 604, or in some implementations memory controller 618 may be an internal part of processor 604.

[0052] Depending on the desired configuration, system memory 606 may be of any type including but not limited to volatile memory (such as RAM), non-volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 606 may include an operating system 620, one or more applications 622, and program data 624.

[0053] Computing device 600 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 602 and any required devices and interfaces. For example, a bus/interface controller 630 may be used to facilitate communications between basic configuration 602 and one or more data storage devices 632 via a storage interface bus 634. Data storage devices 632 may be removable storage devices

636, non-removable storage devices 638, or a combination thereof. Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0054] System memory 606, removable storage devices 636 and non-removable storage devices 638 are examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store the desired information and which may be accessed by computing device 600. Any such computer storage media may be part of computing device 600.

[0055] Computing device 600 may also include an interface bus 640 for facilitating communication from various interface devices (e.g., output devices 642, peripheral interfaces 644, and communication devices 646) to basic configuration 602 via bus/interface controller 630. Example output devices 642 include a graphics processing unit 648 and an audio processing unit 650, which may be configured to communicate to various external devices such as a display or speakers via one or more A/V ports 652. Example peripheral interfaces 644 include a serial interface controller 654 or a parallel interface controller 656, which may be configured to communicate with external devices such as input devices (e.g., keyboard, mouse, pen, voice input device, touch input device, etc.) or other peripheral devices (e.g., printer, scanner, etc.) via one or more I/O ports 658. An example communication device 646 includes a network controller 660, which may be arranged to facilitate communications with one or more other computing devices 662 over a network communication link via one or more communication ports 664.

[0056] The network communication link may be one example of a communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and may include any information delivery media. A "modulated data signal" may be a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), microwave, infrared (IR) and other wireless media. The term computer readable media as used herein may include both storage media and communication media.

[0057] Computing device 600 may be implemented as a portion of a small-form factor portable (or mobile) electronic device such as a cell phone, a personal data assistant (PDA), a personal media player device, a wireless web-watch device, a personal headset device, an application specific device, or a hybrid device that include any of the above functions. Computing device 600 may also be implemented as a personal computer including both laptop computer and non-laptop computer configurations.

[0058] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems, which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (*e.g.*, bodies of the appended claims) are generally intended as "open" terms (*e.g.*, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (*e.g.*, "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (*e.g.*, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention

analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0062] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0063] From the foregoing, it will be appreciated that various embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. Accordingly, the various

embodiments disclosed herein are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

CLAIMS

What is claimed is:

1. A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. The method of Claim 1, further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. The method of Claim 1, further comprising:

receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. The end device of Claim 11, wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. A computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

22. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. The computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. The computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

FIG. 1

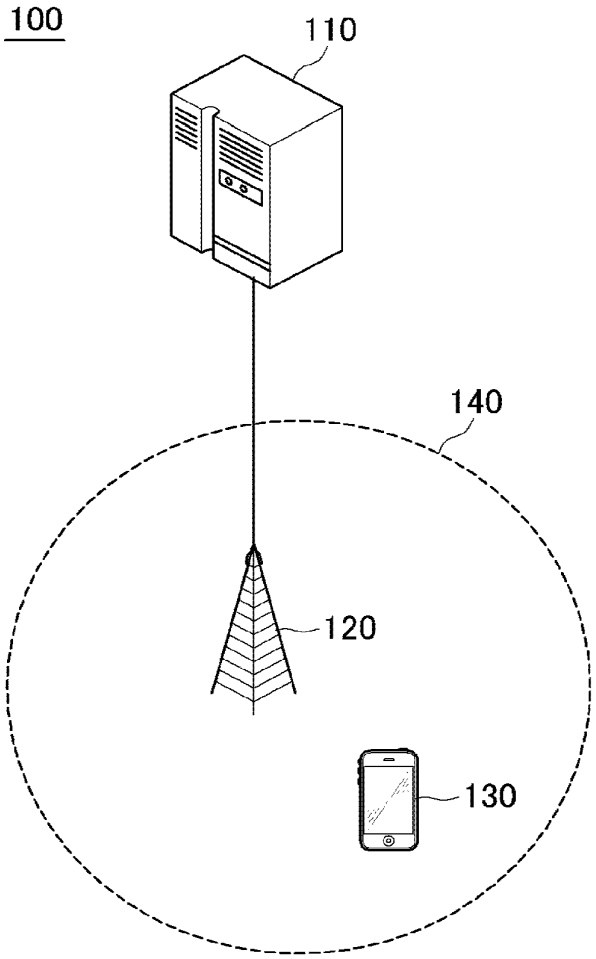


FIG. 2

200

ACCESS POINT	MAC ADDRESS	SSID
AUTHENTICATED ACCESS POINT 1	xxx111yyy	zzz
AUTHENTICATED ACCESS POINT 2	zzz222xxx	yyy
...	...	...

FIG. 3

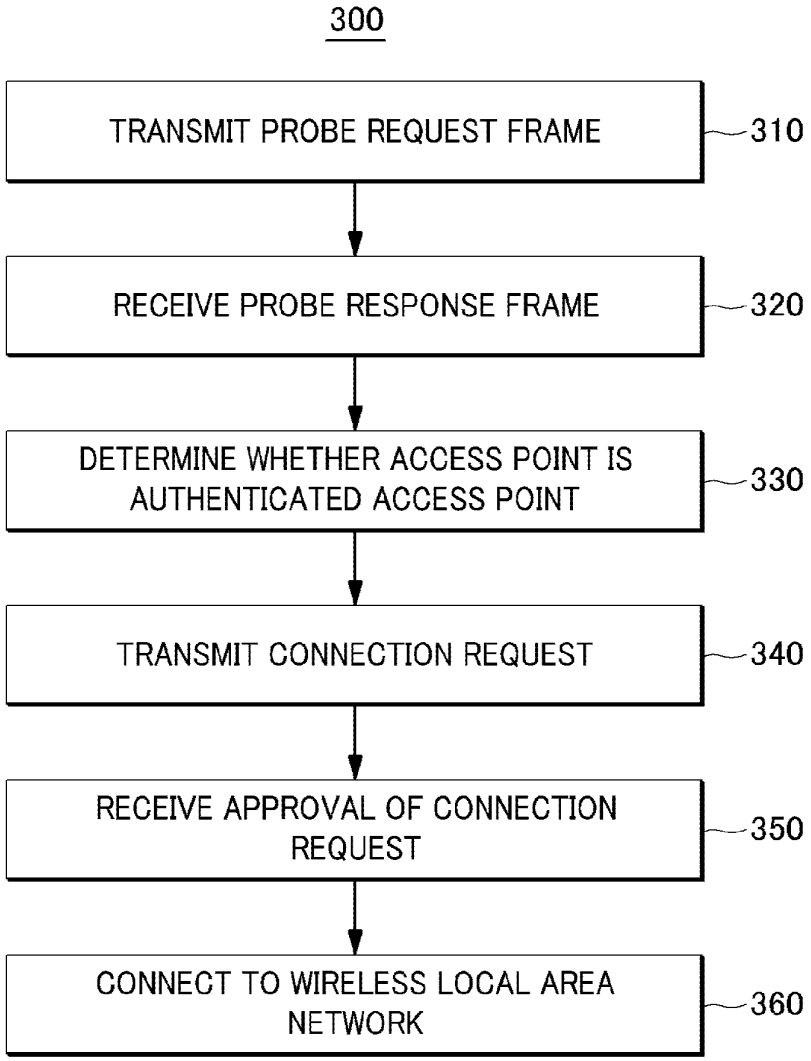

300
TRANSMIT PROBE REQUEST FRAME
310
RECEIVE PROBE RESPONSE FRAME
320
DETERMINE WHETHER ACCESS POINT IS AUTHENTICATED ACCESS POINT
330
TRANSMIT CONNECTION REQUEST
340
RECEIVE APPROVAL OF CONNECTION REQUEST
350
CONNECT TO WIRELESS LOCAL AREA NETWORK
360

FIG. 4

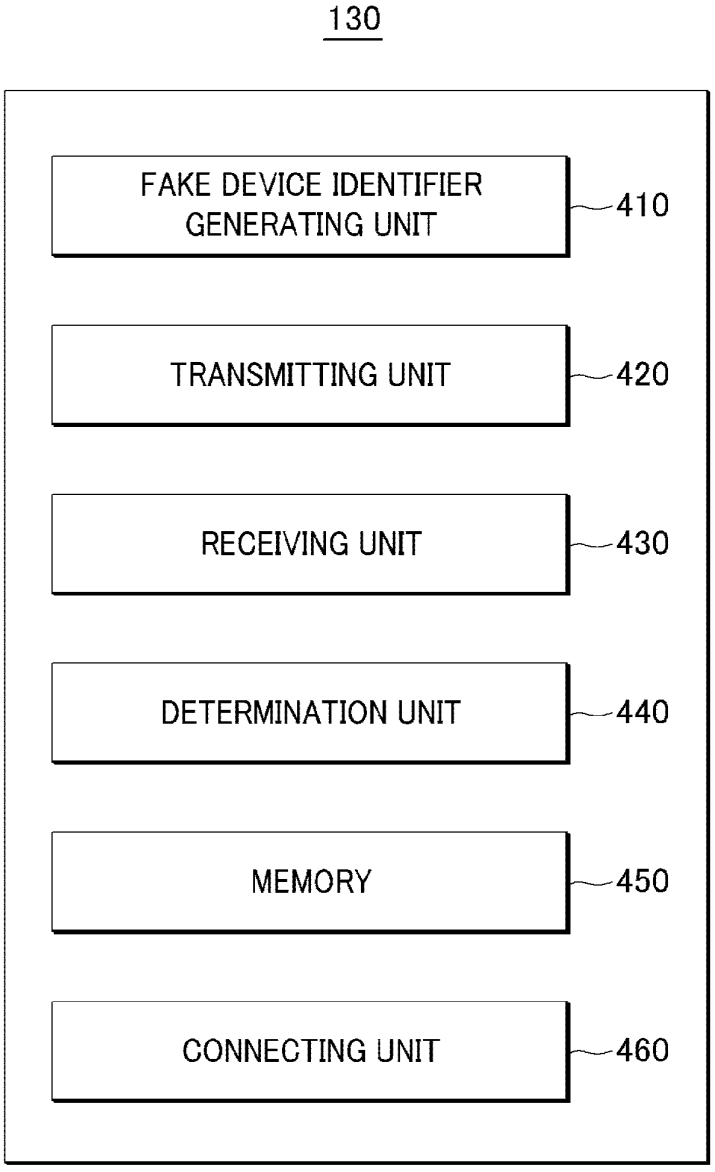

130
FAKE DEVICE IDENTIFIER GENERATING UNIT
410
TRANSMITTING UNIT
420
RECEIVING UNIT
430
DETERMINATION UNIT
440
MEMORY
450
CONNECTING UNIT
460

FIG. 5

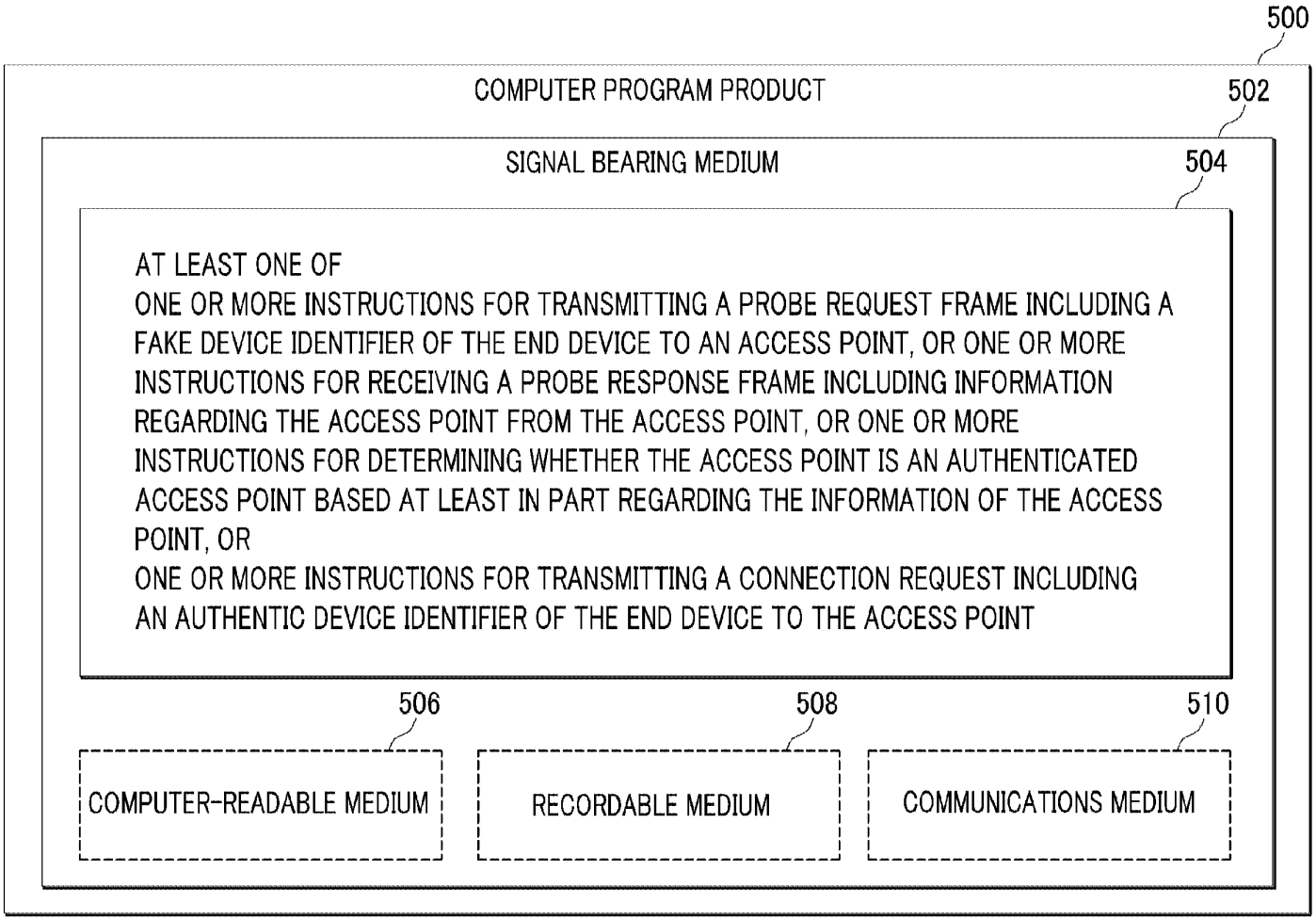
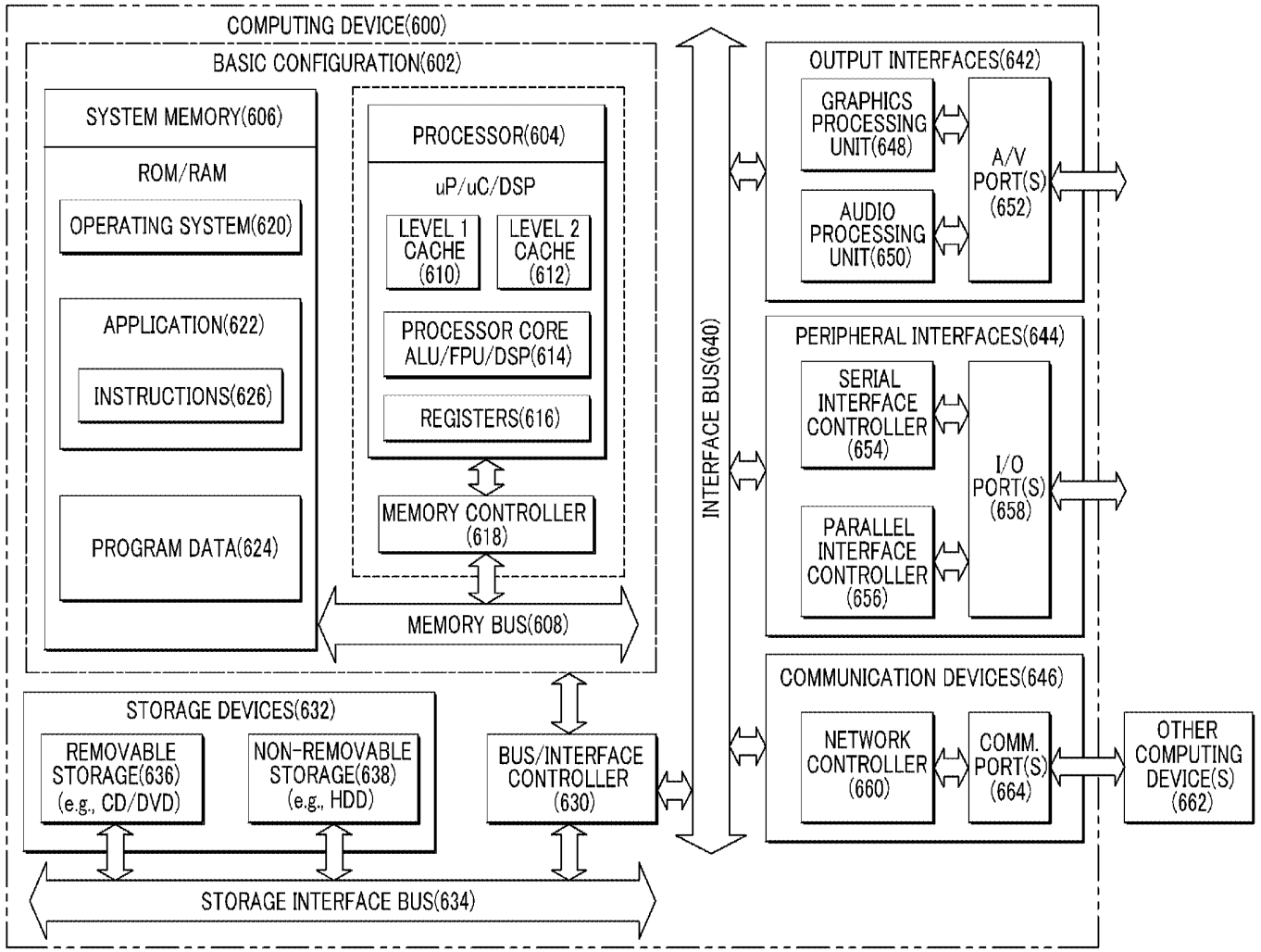

500
COMPUTER PROGRAM PRODUCT
502
SIGNAL BEARING MEDIUM
504
AT LEAST ONE OF
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A PROBE REQUEST FRAME INCLUDING A FAKE DEVICE IDENTIFIER OF THE END DEVICE TO AN ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR RECEIVING A PROBE RESPONSE FRAME INCLUDING INFORMATION REGARDING THE ACCESS POINT FROM THE ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR DETERMINING WHETHER THE ACCESS POINT IS AN AUTHENTICATED ACCESS POINT BASED AT LEAST IN PART REGARDING THE INFORMATION OF THE ACCESS POINT, OR
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A CONNECTION REQUEST INCLUDING AN AUTHENTIC DEVICE IDENTIFIER OF THE END DEVICE TO THE ACCESS POINT
506
508
510
COMPUTER-READABLE MEDIUM
RECORDABLE MEDIUM
COMMUNICATIONS MEDIUM

FIG. 6


COMPUTING DEVICE(600)
BASIC CONFIGURATION(602)
SYSTEM MEMORY(606)
ROM/RAM
OPERATING SYSTEM(620)
APPLICATION(622)
INSTRUCTIONS(626)
PROGRAM DATA(624)
PROCESSOR(604)
uP/uC/DSP
LEVEL 1 CACHE (610)
LEVEL 2 CACHE (612)
PROCESSOR CORE ALU/FPU/DSP(614)
REGISTERS(616)
MEMORY CONTROLLER (618)
MEMORY BUS(608)
INTERFACE BUS(640)
OUTPUT INTERFACES(642)
GRAPHICS PROCESSING UNIT(648)
AUDIO PROCESSING UNIT(650)
A/V PORT(S) (652)
PERIPHERAL INTERFACES(644)
SERIAL INTERFACE CONTROLLER (654)
PARALLEL INTERFACE CONTROLLER (656)
I/O PORT(S) (658)
COMMUNICATION DEVICES(646)
NETWORK CONTROLLER (660)
COMM. PORT(S) (664)
OTHER COMPUTING DEVICE(S) (662)
STORAGE DEVICES(632)
REMOVABLE STORAGE(636) (e.g., CD/DVD)
NON-REMOVABLE STORAGE(638) (e.g., HDD)
BUS/INTERFACE CONTROLLER (630)
STORAGE INTERFACE BUS(634)

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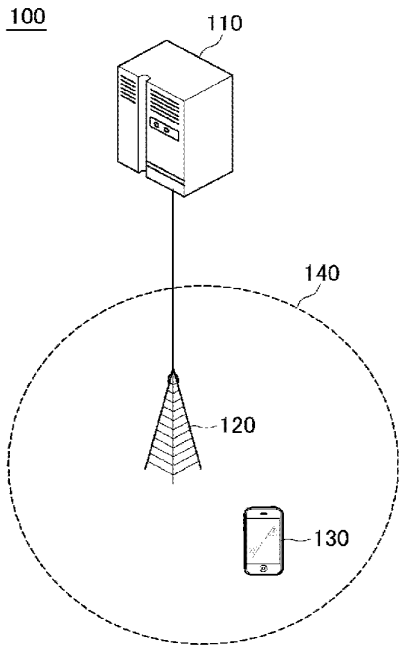
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[Continued on next page]

(54) Title: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

(57) Abstract: Technologies are generally described for connecting to a wireless local area network. In some examples, a method performed under control of an end device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

FIG. 1



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CLAIMS

What is claimed is:

1. A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. The method of Claim 1, further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. The method of Claim 1, further comprising:

receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. The end device of Claim 11, wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. A computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

22. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. The computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. The computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

SCHEMES FOR CONNECTING TO WIRELESS NETWORK

BACKGROUND

[0001] The availability of third generation (3G) and fourth generation (4G) mobile telecommunications technologies, and Wi-Fi wireless access technologies make it possible to provide wireless data communications. It is generally preferable to use Wi-Fi networks for data transmission because Wi-Fi wireless access technologies are typically available at lower cost but with higher throughput than the third generation (3G) and/or fourth generation (4G) mobile telecommunications technologies. However, security for Wi-Fi wireless access technologies has drawn intense scrutiny.

SUMMARY

[0002] In an example, a method performed under control of an end device first device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

[0003] In another example, an end device may include a transmitting unit configured to transmit a probe request frame including a fake device identifier to an access point, a receiving unit configured to receive a probe response frame including information regarding the access point from the access point, a memory configured to store an authenticated access point list including information regarding at least one authenticated access point, a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list, and a connecting unit configured to connect to a wireless local area network provided by the access point. The transmitting unit is further

configured to transmit a connection request including an original device identifier to the access point, and the receiving unit is further configured to receive an approval of the connection request from the access point.

[0004] In yet another example, a computer-readable storage medium may store thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, including transmitting a probe request frame including a fake device identifier of the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and transmitting a connection request including an original device identifier of the end device to the access point.

[0005] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

[0006] The foregoing and other features of this disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. With the understanding that these drawings depict only several embodiments in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[0007] **Fig. 1** schematically shows an illustrative example of a network communications environment including a mobile operating server, an access point and an end device, arranged in accordance with at least some embodiments described herein;

[0008] **Fig. 2** schematically shows an illustrative example of an authenticated access point list, arranged in accordance with at least some embodiments described herein;

[0009] **Fig. 3** shows an example flow diagram of a process of an end device for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein;

[0010] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device, arranged in accordance with at least some embodiments described herein;

[0011] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein; and

[0012] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0014] This disclosure is generally drawn, *inter alia*, to methods, apparatuses, systems, devices, and computer program products related to secured wireless network communication schemes.

[0015] Technologies are generally described for connecting to wireless networks while preventing leakage of location information of an end device.

[0016] In general, in order to connect to a wireless local area network (WLAN), an end device may search for at least one available access point around the end device. By way of example, but not limitation, the access point may be a Wi-Fi access point and the WLAN may be a Wi-Fi network. When searching, the

end device may transmit a probe request frame that may include a device identifier, for the end device such as a media access control (MAC) address of the end device. In such cases, since the probe request frame that includes the device identifier is transmitted to access points around the end device, present location information of the end device may be exposed to some access points with which a user of the end device does not want to be connected and/or other devices to which the end device does not want to disclose the present location information.

[0017] In some embodiments, an end device may transmit a probe request frame that includes a fake device identifier for the end device to at least one access point around the end device. As a response to the probe request frame, the end device may receive a probe response frame from one or more access points. The probe response frame may include information regarding the access point. By way of example, but not limitation, the information regarding the access point may include a MAC address of the access point and/or a service set identifier (SSID) of the access point.

[0018] The end device may determine whether there is an authenticated access point around the end device based at least in part on the information included in the probe response frame. If there is an authenticated access point around the end device, the end device may transmit a connection request including an authentic device identifier for the end device, such as an original MAC address, to the authenticated access point. Then, the end device may connect to a wireless local area network provided by the authenticated access point without a leakage of present location information of the end device to undesirable access points.

[0019] **Fig. 1** schematically shows an illustrative example of a network communications environment 100 including a mobile operating server, an access point, and an end device, arranged in accordance with at least some embodiments described herein.

[0020] As illustrated in Fig. 1, network communications environment 100 may include a mobile operating server 110, an access point 120 and an end device 130. Mobile operating server 110 may control access point 120. In Fig 1, although only one access point (i.e., access point 120) is located around end device 130, so that end device 130 is located in a network area 140 provided by access point 120, there could be two or more access points around end device 130.

[0021] By way of example, access point 120 may include a Wi-Fi access point and provide a WLAN that includes a Wi-Fi network. Further, by way of example, end device 130 may include, but not exclusively, a personal communication terminal, such as PCS (Personal Communication System), GMS (Global System for Mobile communications), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), PDA (Personal Digital Assistant), IMT (International Mobile Telecommunication)-2000, CDMA (Code Division Multiple Access)-2000, W-CDMA (W-Code Division Multiple Access) and Wibro (Wireless Broadband Internet) terminals.

[0022] End device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include one or both of one or more random numbers or one or more random characters. In some embodiments, end device 130 may generate the fake device identifier and transmit the generated fake device identifier to access point 120. Further, in some other embodiments, mobile operating server 110 may provide end device 130 with the fake device identifier, and end device 130 may transmit the provided fake device identifier to access point 120.

[0023] End device 130 may receive a probe response frame from access point 120 to which end device 130 transmitted the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0024] End device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, end device 130 may receive an authenticated access point list including information regarding at least one authenticated access point from mobile operating server 110. End device 130 may determine whether access point 120 is an authenticated access point based at least in part on the authenticated access point list. By way of example, end device 130 may check whether the information regarding access point 120 is included in the authenticated access

point list. If the information regarding access point 120 is included in the authenticated access point list, end device 130 may recognize access point 120 as an authenticated access point. By way of example, but not limitation, the authenticated access point may include an access point controlled by mobile operating server 110 and/or an access point previously connected with end device 130.

[0025] **Fig. 2** schematically shows an illustrative example of an authenticated access point list 200, arranged in accordance with at least some embodiments described herein. As illustrated in Fig. 2, authenticated access point list 200 may include the information regarding at least one authenticated access point. By way of example, but not limitation, the information regarding the least one authenticated access point may include a MAC address or an SSID of each authenticated access point.

[0026] Referring back to Fig. 1, end device 130 may transmit a connection request, including an authentic device identifier, to authenticated access point 120 for end device 130. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130. In some embodiments, the connection request may include an authentication request for authenticated access point 120 to authenticate end device 130. Further, the authentication request may include a shared key between access point 120 and end device 130.

[0027] End device 130 may receive an approval of the connection request from access point 120. In some embodiments, the approval of the connection request may include an authentication response.

[0028] End device 130 may transmit an association request to access point 120 in response to the approval of the connection request and, in response to the association request, access point 120 may transmit an association response to end device 130. Then, end device 130 may connect to the wireless local area network provided by access point 120.

[0029] **Fig. 3** shows an example flow diagram of a process 300 of an end device 130 for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. The method in Fig. 3 may be implemented in the network communication environment including mobile

operating server 110, access point 120 and end device 130, as illustrated in Fig. 1. An example process may include one or more operations, actions, or functions as illustrated by one or more blocks 310, 320, 330, 340, 350 and/or 360. Although illustrated as discrete blocks, various blocks may be divided into additional blocks, combined into fewer blocks, or eliminated, depending on the desired implementation. Processing may begin at block 310.

[0030] At block 310 (Transmit Probe Request Frame), end device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include at least one of a random number or a random character. Processing may proceed from block 310 to block 320.

[0031] At block 320 (Receive Probe Response Frame), end device 130 may receive a probe response frame from access point 120 as a response to the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120. Processing may proceed from block 320 to block 330.

[0032] At block 330 (Determine Whether Access Point is Authenticated Access Point), end device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120 included in the probe response frame. In some embodiments, end device 130 may receive authenticated access point list 200, as illustrated in Fig. 2, from mobile operating server 110. Authenticated access point list 200 may include information regarding at least one authenticated access point.

[0033] At block 330, end device 130 may check whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point. Processing may proceed from block 330 to block 340.

[0034] At block 340 (Transmit Connection Request), end device 130 may transmit a connection request including an authentic device identifier for end device 130 to access point 120 which is recognized as the authenticated access point at block 330. By way of example, but not limitation, the authentic device identifier may include an origianl MAC address of end device 130. Processing may proceed from block 340 to block 350.

[0035] At block 350 (Receive Approval of Connection Request), end device 130 may receive an approval of the connection request from access point 120. Processing may proceed from block 350 to block 360.

[0036] At block 360 (Connect to Wireless Local Area Network), end device 130 may connect to a wireless local area network provided by access point 120. By way of example, but not limitation, the wireless local area network provided by access point 120 may include a Wi-Fi network.

[0037] One skilled in the art will appreciate that, for this and other processes and methods disclosed herein, the functions performed in the processes and methods may be implemented in differing order. Furthermore, the outlined steps and operations are only provided as examples, and some of the steps and operations may be optional, combined into fewer steps and operations, or expanded into additional steps and operations without detracting from the essence of the disclosed embodiments.

[0038] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device 130, arranged in accordance with at least some embodiments described herein. As depicted in Fig. 4, end device 130 may include a fake device identifier generating unit 410, a transmitting unit 420, a receiving unit 430, a determination unit 440, a memory 450, and a connecting unit 460. Although illustrated as discrete components, various components may be divided into additional components, combined into fewer components, or eliminated altogether while being contemplated within the scope of the disclosed subject matter.

[0039] Fake device identifier generating unit 410 may generate a fake device identifier (for example, a fake MAC address) for end device 130. By way of example, but not limitation, the fake device identifier may include a random number and/or a random character.

[0040] Transmitting unit 420 may transmit, to access point 120, a probe request frame which may include the fake device identifier generated by fake device identifier generating unit 410.

[0041] Receiving unit 430 may receive a probe response frame from access point 120 to which the probe request frame is transmitted. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0042] In some embodiments, receiving unit 430 may receive a fake device identifier (for example, a fake MAC address) for end device 130 from mobile operating server 110. In such cases, transmitting unit 420 may transmit, to access point 120, a probe request frame that includes the fake device identifier received from mobile operating server 110.

[0043] Determination unit 440 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, determination unit 440 may compare the information regarding access point 120, which is included in the probe response frame, and information regarding authenticated access points, which is included in authenticated access point list 200 as illustrated in Fig. 2. The information regarding the authenticated access points may include a MAC address and/or an SSID of each of the authenticated access points.

[0044] Determination unit 440 may determine whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point.

[0045] Memory 450 may store authenticated access point list 200. In some embodiments, receiving unit 430 may receive authenticated access point list 200 from mobile operating server 110 and memory 450 may store the received authenticated access point list 200. Further, memory 450 may store the fake device identifier which is generated by fake device identifier generating unit 410 or received from mobile operating server 110.

[0046] Transmitting unit 420 may transmit a connection request, which includes an authentic device identifier, for end device 130 to access point 120 that is recognized as the authenticated access point by determination unit 440. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130.

[0047] Receiving unit 430 may receive an approval of the connection request from access point 120 and connecting unit 460 may connect to a wireless local area network provided by access point 120.

[0048] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. Program product 500 may include a signal bearing medium 510. Signal bearing medium 510 may include one or more instructions 520 that, when executed by, for example, a processor, may provide the functionality described above with respect to Figs. 1-4. By way of example, instructions 520 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to Fig. 4, end device 130 may undertake one or more of the blocks shown in Fig. 3 in response to instructions 520.

[0049] In some implementations, signal bearing medium 510 may encompass a computer-readable medium 530, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium 510 may encompass a recordable medium 540, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 510 may encompass a communications medium 550, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a

wireless communication link, etc.). Thus, for example, program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 520, where the signal bearing medium 520 is conveyed by a wireless communications medium 550 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

[0050] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. In these examples, elements of computing device 600 may be arranged or configured for a mobile operating server or an end device. In a very basic configuration 602, computing device 600 typically includes one or more processors 604 and a system memory 606. A memory bus 608 may be used for communicating between processor 604 and system memory 606.

[0051] Depending on the desired configuration, processor 604 may be of any type including but not limited to a microprocessor (μP), a microcontroller (μC), a digital signal processor (DSP), or any combination thereof. Processor 604 may include one more levels of caching, such as a level one cache 610 and a level two cache 612, a processor core 614, and registers 616. An example processor core 614 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processing core (DSP Core), or any combination thereof. An example memory controller 618 may also be used with processor 604, or in some implementations memory controller 618 may be an internal part of processor 604.

[0052] Depending on the desired configuration, system memory 606 may be of any type including but not limited to volatile memory (such as RAM), non-volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 606 may include an operating system 620, one or more applications 622, and program data 624.

[0053] Computing device 600 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 602 and any required devices and interfaces. For example, a bus/interface controller 630 may be used to facilitate communications between basic configuration 602 and one or more data storage devices 632 via a storage interface bus 634. Data storage devices 632 may be removable storage devices

636, non-removable storage devices 638, or a combination thereof. Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0054] System memory 606, removable storage devices 636 and non-removable storage devices 638 are examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store the desired information and which may be accessed by computing device 600. Any such computer storage media may be part of computing device 600.

[0055] Computing device 600 may also include an interface bus 640 for facilitating communication from various interface devices (e.g., output devices 642, peripheral interfaces 644, and communication devices 646) to basic configuration 602 via bus/interface controller 630. Example output devices 642 include a graphics processing unit 648 and an audio processing unit 650, which may be configured to communicate to various external devices such as a display or speakers via one or more A/V ports 652. Example peripheral interfaces 644 include a serial interface controller 654 or a parallel interface controller 656, which may be configured to communicate with external devices such as input devices (e.g., keyboard, mouse, pen, voice input device, touch input device, etc.) or other peripheral devices (e.g., printer, scanner, etc.) via one or more I/O ports 658. An example communication device 646 includes a network controller 660, which may be arranged to facilitate communications with one or more other computing devices 662 over a network communication link via one or more communication ports 664.

[0056] The network communication link may be one example of a communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and may include any information delivery media. A "modulated data signal" may be a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), microwave, infrared (IR) and other wireless media. The term computer readable media as used herein may include both storage media and communication media.

[0057] Computing device 600 may be implemented as a portion of a small-form factor portable (or mobile) electronic device such as a cell phone, a personal data assistant (PDA), a personal media player device, a wireless web-watch device, a personal headset device, an application specific device, or a hybrid device that include any of the above functions. Computing device 600 may also be implemented as a personal computer including both laptop computer and non-laptop computer configurations.

[0058] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems, which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (*e.g.*, bodies of the appended claims) are generally intended as "open" terms (*e.g.*, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (*e.g.*, "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (*e.g.*, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention

analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0062] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0063] From the foregoing, it will be appreciated that various embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. Accordingly, the various

embodiments disclosed herein are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

FIG. 1

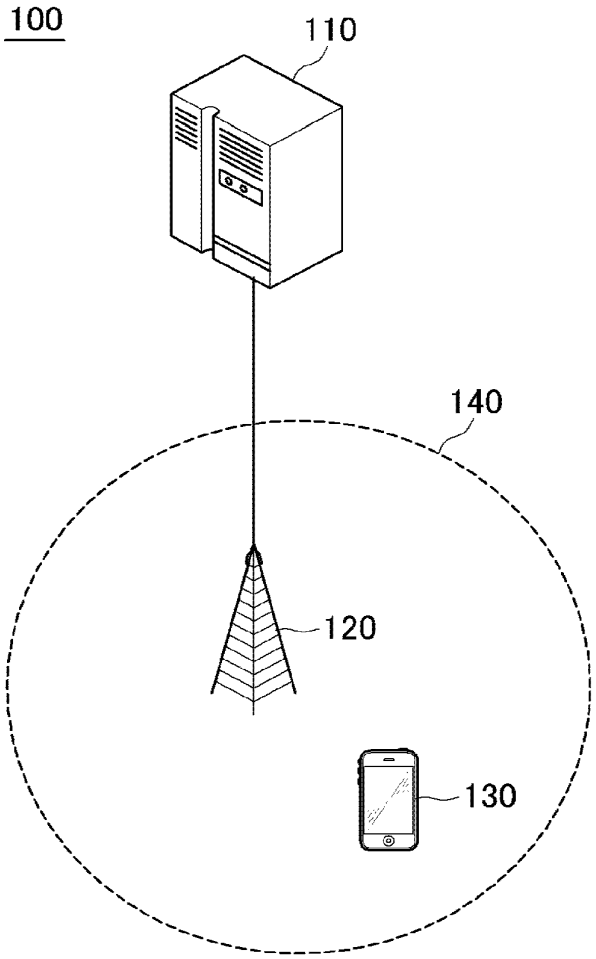


FIG. 2

200

ACCESS POINT	MAC ADDRESS	SSID
AUTHENTICATED ACCESS POINT 1	xxx111yyy	zzz
AUTHENTICATED ACCESS POINT 2	zzz222xxx	yyy
...	...	...

FIG. 3

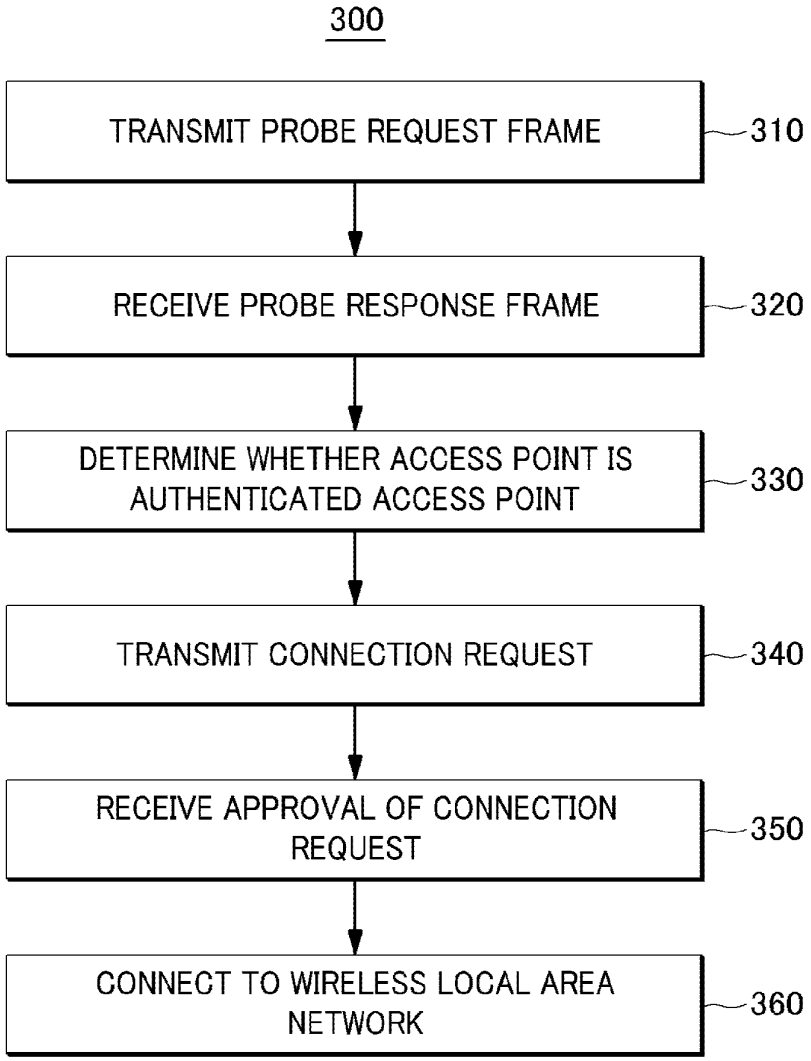

300
TRANSMIT PROBE REQUEST FRAME
310
RECEIVE PROBE RESPONSE FRAME
320
DETERMINE WHETHER ACCESS POINT IS AUTHENTICATED ACCESS POINT
330
TRANSMIT CONNECTION REQUEST
340
RECEIVE APPROVAL OF CONNECTION REQUEST
350
CONNECT TO WIRELESS LOCAL AREA NETWORK
360

FIG. 4

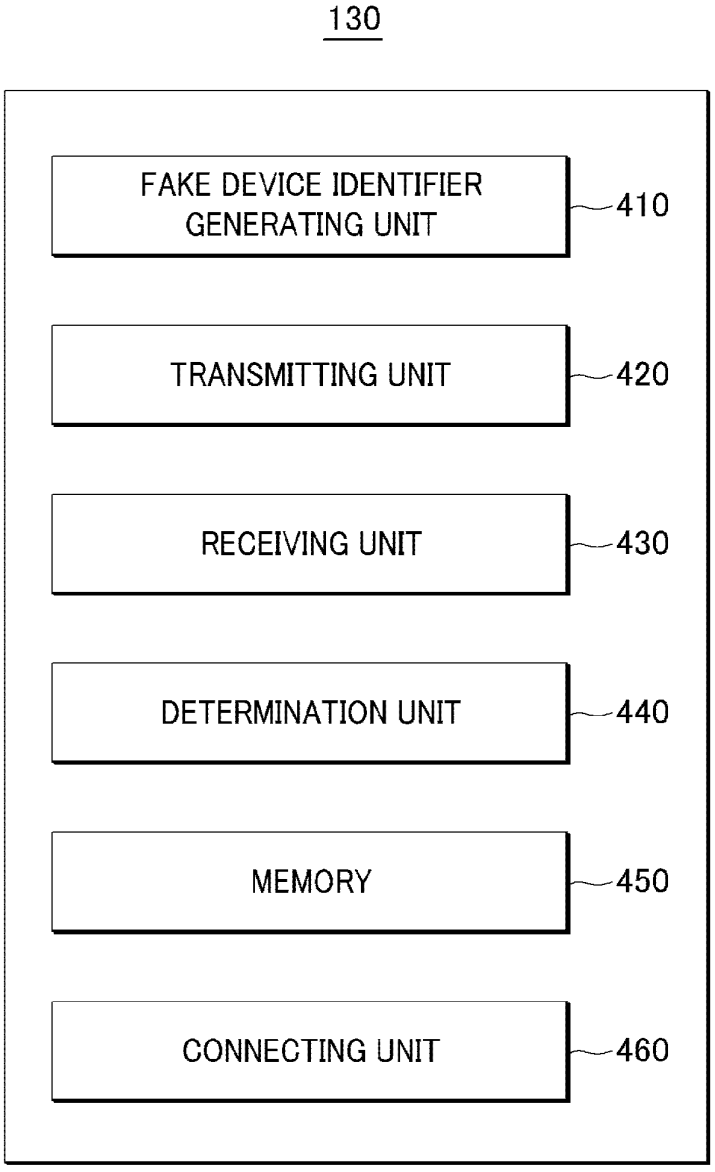

130
FAKE DEVICE IDENTIFIER GENERATING UNIT
410
TRANSMITTING UNIT
420
RECEIVING UNIT
430
DETERMINATION UNIT
440
MEMORY
450
CONNECTING UNIT
460

FIG. 5

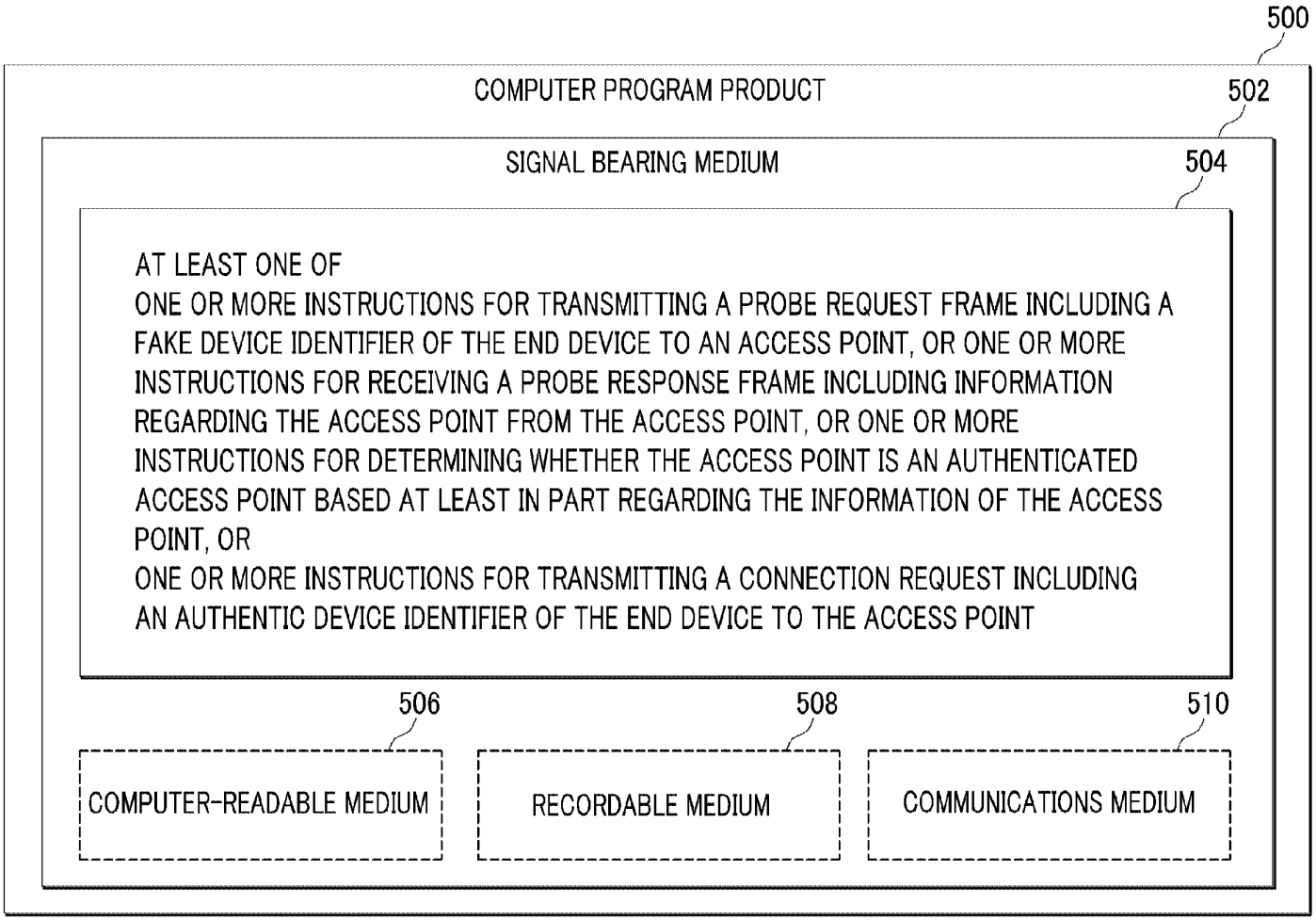
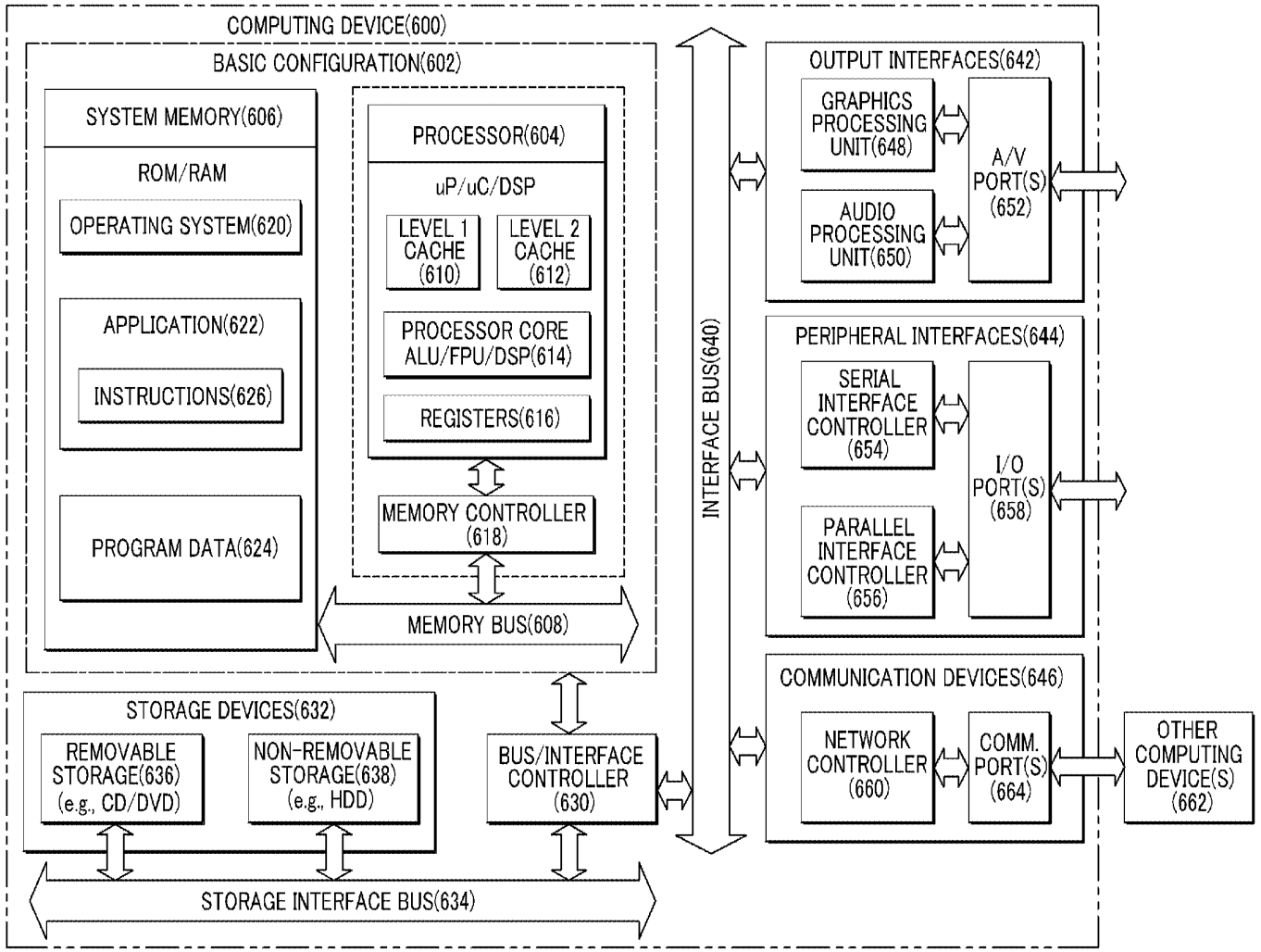

500
COMPUTER PROGRAM PRODUCT
502
SIGNAL BEARING MEDIUM
504
AT LEAST ONE OF
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A PROBE REQUEST FRAME INCLUDING A FAKE DEVICE IDENTIFIER OF THE END DEVICE TO AN ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR RECEIVING A PROBE RESPONSE FRAME INCLUDING INFORMATION REGARDING THE ACCESS POINT FROM THE ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR DETERMINING WHETHER THE ACCESS POINT IS AN AUTHENTICATED ACCESS POINT BASED AT LEAST IN PART REGARDING THE INFORMATION OF THE ACCESS POINT, OR
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A CONNECTION REQUEST INCLUDING AN AUTHENTIC DEVICE IDENTIFIER OF THE END DEVICE TO THE ACCESS POINT
506
508
510
COMPUTER-READABLE MEDIUM
RECORDABLE MEDIUM
COMMUNICATIONS MEDIUM

FIG. 6


COMPUTING DEVICE(600)
BASIC CONFIGURATION(602)
SYSTEM MEMORY(606)
ROM/RAM
OPERATING SYSTEM(620)
APPLICATION(622)
INSTRUCTIONS(626)
PROGRAM DATA(624)
PROCESSOR(604)
uP/uC/DSP
LEVEL 1 CACHE (610)
LEVEL 2 CACHE (612)
PROCESSOR CORE ALU/FPU/DSP(614)
REGISTERS(616)
MEMORY CONTROLLER (618)
MEMORY BUS(608)
INTERFACE BUS(640)
OUTPUT INTERFACES(642)
GRAPHICS PROCESSING UNIT(648)
AUDIO PROCESSING UNIT(650)
A/V PORT(S) (652)
PERIPHERAL INTERFACES(644)
SERIAL INTERFACE CONTROLLER (654)
PARALLEL INTERFACE CONTROLLER (656)
I/O PORT(S) (658)
COMMUNICATION DEVICES(646)
NETWORK CONTROLLER (660)
COMM. PORT(S) (664)
OTHER COMPUTING DEVICE(S) (662)
STORAGE DEVICES(632)
REMOVABLE STORAGE(636) (e.g., CD/DVD)
NON-REMOVABLE STORAGE(638) (e.g., HDD)
BUS/INTERFACE CONTROLLER (630)
STORAGE INTERFACE BUS(634)

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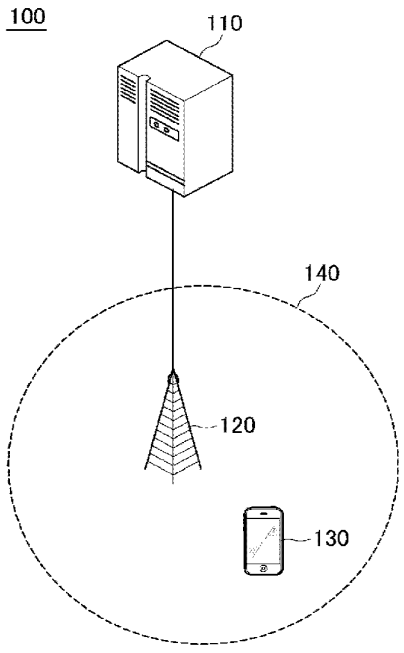
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[Continued on next page]

(54) Title: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

(57) Abstract: Technologies are generally described for connecting to a wireless local area network. In some examples, a method performed under control of an end device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

FIG. 1



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SCHEMES FOR CONNECTING TO WIRELESS NETWORK

BACKGROUND

[0001] The availability of third generation (3G) and fourth generation (4G) mobile telecommunications technologies, and Wi-Fi wireless access technologies make it possible to provide wireless data communications. It is generally preferable to use Wi-Fi networks for data transmission because Wi-Fi wireless access technologies are typically available at lower cost but with higher throughput than the third generation (3G) and/or fourth generation (4G) mobile telecommunications technologies. However, security for Wi-Fi wireless access technologies has drawn intense scrutiny.

SUMMARY

[0002] In an example, a method performed under control of an end device first device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

[0003] In another example, an end device may include a transmitting unit configured to transmit a probe request frame including a fake device identifier to an access point, a receiving unit configured to receive a probe response frame including information regarding the access point from the access point, a memory configured to store an authenticated access point list including information regarding at least one authenticated access point, a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list, and a connecting unit configured to connect to a wireless local area network provided by the access point. The transmitting unit is further

configured to transmit a connection request including an original device identifier to the access point, and the receiving unit is further configured to receive an approval of the connection request from the access point.

[0004] In yet another example, a computer-readable storage medium may store thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, including transmitting a probe request frame including a fake device identifier of the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and transmitting a connection request including an original device identifier of the end device to the access point.

[0005] The foregoing summary is illustrative only and is not intended to be in any way limiting. In addition to the illustrative aspects, embodiments, and features described above, further aspects, embodiments, and features will become apparent by reference to the drawings and the following detailed description.

BRIEF DESCRIPTION OF THE FIGURES

[0006] The foregoing and other features of this disclosure will become more fully apparent from the following description and appended claims, taken in conjunction with the accompanying drawings. With the understanding that these drawings depict only several embodiments in accordance with the disclosure and are, therefore, not to be considered limiting of its scope, the disclosure will be described with additional specificity and detail through use of the accompanying drawings, in which:

[0007] **Fig. 1** schematically shows an illustrative example of a network communications environment including a mobile operating server, an access point and an end device, arranged in accordance with at least some embodiments described herein;

[0008] **Fig. 2** schematically shows an illustrative example of an authenticated access point list, arranged in accordance with at least some embodiments described herein;

[0009] **Fig. 3** shows an example flow diagram of a process of an end device for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein;

[0010] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device, arranged in accordance with at least some embodiments described herein;

[0011] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein; and

[0012] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein.

DETAILED DESCRIPTION

[0013] In the following detailed description, reference is made to the accompanying drawings, which form a part hereof. In the drawings, similar symbols typically identify similar components, unless context dictates otherwise. The illustrative embodiments described in the detailed description, drawings, and claims are not meant to be limiting. Other embodiments may be utilized, and other changes may be made, without departing from the spirit or scope of the subject matter presented herein. It will be readily understood that the aspects of the present disclosure, as generally described herein, and illustrated in the Figures, can be arranged, substituted, combined, separated, and designed in a wide variety of different configurations, all of which are explicitly contemplated herein.

[0014] This disclosure is generally drawn, *inter alia*, to methods, apparatuses, systems, devices, and computer program products related to secured wireless network communication schemes.

[0015] Technologies are generally described for connecting to wireless networks while preventing leakage of location information of an end device.

[0016] In general, in order to connect to a wireless local area network (WLAN), an end device may search for at least one available access point around the end device. By way of example, but not limitation, the access point may be a Wi-Fi access point and the WLAN may be a Wi-Fi network. When searching, the

end device may transmit a probe request frame that may include a device identifier, for the end device such as a media access control (MAC) address of the end device. In such cases, since the probe request frame that includes the device identifier is transmitted to access points around the end device, present location information of the end device may be exposed to some access points with which a user of the end device does not want to be connected and/or other devices to which the end device does not want to disclose the present location information.

[0017] In some embodiments, an end device may transmit a probe request frame that includes a fake device identifier for the end device to at least one access point around the end device. As a response to the probe request frame, the end device may receive a probe response frame from one or more access points. The probe response frame may include information regarding the access point. By way of example, but not limitation, the information regarding the access point may include a MAC address of the access point and/or a service set identifier (SSID) of the access point.

[0018] The end device may determine whether there is an authenticated access point around the end device based at least in part on the information included in the probe response frame. If there is an authenticated access point around the end device, the end device may transmit a connection request including an authentic device identifier for the end device, such as an original MAC address, to the authenticated access point. Then, the end device may connect to a wireless local area network provided by the authenticated access point without a leakage of present location information of the end device to undesirable access points.

[0019] **Fig. 1** schematically shows an illustrative example of a network communications environment 100 including a mobile operating server, an access point, and an end device, arranged in accordance with at least some embodiments described herein.

[0020] As illustrated in Fig. 1, network communications environment 100 may include a mobile operating server 110, an access point 120 and an end device 130. Mobile operating server 110 may control access point 120. In Fig 1, although only one access point (i.e., access point 120) is located around end device 130, so that end device 130 is located in a network area 140 provided by access point 120, there could be two or more access points around end device 130.

[0021] By way of example, access point 120 may include a Wi-Fi access point and provide a WLAN that includes a Wi-Fi network. Further, by way of example, end device 130 may include, but not exclusively, a personal communication terminal, such as PCS (Personal Communication System), GMS (Global System for Mobile communications), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), PDA (Personal Digital Assistant), IMT (International Mobile Telecommunication)-2000, CDMA (Code Division Multiple Access)-2000, W-CDMA (W-Code Division Multiple Access) and Wibro (Wireless Broadband Internet) terminals.

[0022] End device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include one or both of one or more random numbers or one or more random characters. In some embodiments, end device 130 may generate the fake device identifier and transmit the generated fake device identifier to access point 120. Further, in some other embodiments, mobile operating server 110 may provide end device 130 with the fake device identifier, and end device 130 may transmit the provided fake device identifier to access point 120.

[0023] End device 130 may receive a probe response frame from access point 120 to which end device 130 transmitted the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0024] End device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, end device 130 may receive an authenticated access point list including information regarding at least one authenticated access point from mobile operating server 110. End device 130 may determine whether access point 120 is an authenticated access point based at least in part on the authenticated access point list. By way of example, end device 130 may check whether the information regarding access point 120 is included in the authenticated access

point list. If the information regarding access point 120 is included in the authenticated access point list, end device 130 may recognize access point 120 as an authenticated access point. By way of example, but not limitation, the authenticated access point may include an access point controlled by mobile operating server 110 and/or an access point previously connected with end device 130.

[0025] **Fig. 2** schematically shows an illustrative example of an authenticated access point list 200, arranged in accordance with at least some embodiments described herein. As illustrated in Fig. 2, authenticated access point list 200 may include the information regarding at least one authenticated access point. By way of example, but not limitation, the information regarding the least one authenticated access point may include a MAC address or an SSID of each authenticated access point.

[0026] Referring back to Fig. 1, end device 130 may transmit a connection request, including an authentic device identifier, to authenticated access point 120 for end device 130. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130. In some embodiments, the connection request may include an authentication request for authenticated access point 120 to authenticate end device 130. Further, the authentication request may include a shared key between access point 120 and end device 130.

[0027] End device 130 may receive an approval of the connection request from access point 120. In some embodiments, the approval of the connection request may include an authentication response.

[0028] End device 130 may transmit an association request to access point 120 in response to the approval of the connection request and, in response to the association request, access point 120 may transmit an association response to end device 130. Then, end device 130 may connect to the wireless local area network provided by access point 120.

[0029] **Fig. 3** shows an example flow diagram of a process 300 of an end device 130 for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. The method in Fig. 3 may be implemented in the network communication environment including mobile

operating server 110, access point 120 and end device 130, as illustrated in Fig. 1. An example process may include one or more operations, actions, or functions as illustrated by one or more blocks 310, 320, 330, 340, 350 and/or 360. Although illustrated as discrete blocks, various blocks may be divided into additional blocks, combined into fewer blocks, or eliminated, depending on the desired implementation. Processing may begin at block 310.

[0030] At block 310 (Transmit Probe Request Frame), end device 130 may transmit a probe request frame, which may include a fake device identifier (for example, a fake MAC address), to access point 120 for end device 130. By way of example, but not limitation, the fake device identifier may include at least one of a random number or a random character. Processing may proceed from block 310 to block 320.

[0031] At block 320 (Receive Probe Response Frame), end device 130 may receive a probe response frame from access point 120 as a response to the probe request frame. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120. Processing may proceed from block 320 to block 330.

[0032] At block 330 (Determine Whether Access Point is Authenticated Access Point), end device 130 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120 included in the probe response frame. In some embodiments, end device 130 may receive authenticated access point list 200, as illustrated in Fig. 2, from mobile operating server 110. Authenticated access point list 200 may include information regarding at least one authenticated access point.

[0033] At block 330, end device 130 may check whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point. Processing may proceed from block 330 to block 340.

[0034] At block 340 (Transmit Connection Request), end device 130 may transmit a connection request including an authentic device identifier for end device 130 to access point 120 which is recognized as the authenticated access point at block 330. By way of example, but not limitation, the authentic device identifier may include an origianl MAC address of end device 130. Processing may proceed from block 340 to block 350.

[0035] At block 350 (Receive Approval of Connection Request), end device 130 may receive an approval of the connection request from access point 120. Processing may proceed from block 350 to block 360.

[0036] At block 360 (Connect to Wireless Local Area Network), end device 130 may connect to a wireless local area network provided by access point 120. By way of example, but not limitation, the wireless local area network provided by access point 120 may include a Wi-Fi network.

[0037] One skilled in the art will appreciate that, for this and other processes and methods disclosed herein, the functions performed in the processes and methods may be implemented in differing order. Furthermore, the outlined steps and operations are only provided as examples, and some of the steps and operations may be optional, combined into fewer steps and operations, or expanded into additional steps and operations without detracting from the essence of the disclosed embodiments.

[0038] **Fig. 4** shows a schematic block diagram illustrating an example architecture for an end device 130, arranged in accordance with at least some embodiments described herein. As depicted in Fig. 4, end device 130 may include a fake device identifier generating unit 410, a transmitting unit 420, a receiving unit 430, a determination unit 440, a memory 450, and a connecting unit 460. Although illustrated as discrete components, various components may be divided into additional components, combined into fewer components, or eliminated altogether while being contemplated within the scope of the disclosed subject matter.

[0039] Fake device identifier generating unit 410 may generate a fake device identifier (for example, a fake MAC address) for end device 130. By way of example, but not limitation, the fake device identifier may include a random number and/or a random character.

[0040] Transmitting unit 420 may transmit, to access point 120, a probe request frame which may include the fake device identifier generated by fake device identifier generating unit 410.

[0041] Receiving unit 430 may receive a probe response frame from access point 120 to which the probe request frame is transmitted. The probe response frame may include information regarding access point 120. By way of example, but not limitation, the information regarding access point 120 may include a MAC address of access point 120 and/or an SSID of access point 120.

[0042] In some embodiments, receiving unit 430 may receive a fake device identifier (for example, a fake MAC address) for end device 130 from mobile operating server 110. In such cases, transmitting unit 420 may transmit, to access point 120, a probe request frame that includes the fake device identifier received from mobile operating server 110.

[0043] Determination unit 440 may determine whether access point 120, which transmitted the probe response frame to end device 130, is an authenticated access point based at least in part on the information regarding access point 120. In some embodiments, determination unit 440 may compare the information regarding access point 120, which is included in the probe response frame, and information regarding authenticated access points, which is included in authenticated access point list 200 as illustrated in Fig. 2. The information regarding the authenticated access points may include a MAC address and/or an SSID of each of the authenticated access points.

[0044] Determination unit 440 may determine whether the information regarding access point 120, which is included in the probe response frame, is included in authenticated access point list 200. If the information regarding access point 120 is included in authenticated access point list 200, end device 130 may recognize access point 120 as an authenticated access point.

[0045] Memory 450 may store authenticated access point list 200. In some embodiments, receiving unit 430 may receive authenticated access point list 200 from mobile operating server 110 and memory 450 may store the received authenticated access point list 200. Further, memory 450 may store the fake device identifier which is generated by fake device identifier generating unit 410 or received from mobile operating server 110.

[0046] Transmitting unit 420 may transmit a connection request, which includes an authentic device identifier, for end device 130 to access point 120 that is recognized as the authenticated access point by determination unit 440. By way of example, but not limitation, the authentic device identifier may include an original MAC address of end device 130.

[0047] Receiving unit 430 may receive an approval of the connection request from access point 120 and connecting unit 460 may connect to a wireless local area network provided by access point 120.

[0048] **Fig. 5** illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. Program product 500 may include a signal bearing medium 510. Signal bearing medium 510 may include one or more instructions 520 that, when executed by, for example, a processor, may provide the functionality described above with respect to Figs. 1-4. By way of example, instructions 520 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to Fig. 4, end device 130 may undertake one or more of the blocks shown in Fig. 3 in response to instructions 520.

[0049] In some implementations, signal bearing medium 510 may encompass a computer-readable medium 530, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium 510 may encompass a recordable medium 540, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 510 may encompass a communications medium 550, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a

wireless communication link, etc.). Thus, for example, program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 520, where the signal bearing medium 520 is conveyed by a wireless communications medium 550 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

[0050] **Fig. 6** is a block diagram illustrating an example computing device that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. In these examples, elements of computing device 600 may be arranged or configured for a mobile operating server or an end device. In a very basic configuration 602, computing device 600 typically includes one or more processors 604 and a system memory 606. A memory bus 608 may be used for communicating between processor 604 and system memory 606.

[0051] Depending on the desired configuration, processor 604 may be of any type including but not limited to a microprocessor (μP), a microcontroller (μC), a digital signal processor (DSP), or any combination thereof. Processor 604 may include one more levels of caching, such as a level one cache 610 and a level two cache 612, a processor core 614, and registers 616. An example processor core 614 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processing core (DSP Core), or any combination thereof. An example memory controller 618 may also be used with processor 604, or in some implementations memory controller 618 may be an internal part of processor 604.

[0052] Depending on the desired configuration, system memory 606 may be of any type including but not limited to volatile memory (such as RAM), non-volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 606 may include an operating system 620, one or more applications 622, and program data 624.

[0053] Computing device 600 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 602 and any required devices and interfaces. For example, a bus/interface controller 630 may be used to facilitate communications between basic configuration 602 and one or more data storage devices 632 via a storage interface bus 634. Data storage devices 632 may be removable storage devices

636, non-removable storage devices 638, or a combination thereof. Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

[0054] System memory 606, removable storage devices 636 and non-removable storage devices 638 are examples of computer storage media. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disks (DVD) or other optical storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which may be used to store the desired information and which may be accessed by computing device 600. Any such computer storage media may be part of computing device 600.

[0055] Computing device 600 may also include an interface bus 640 for facilitating communication from various interface devices (e.g., output devices 642, peripheral interfaces 644, and communication devices 646) to basic configuration 602 via bus/interface controller 630. Example output devices 642 include a graphics processing unit 648 and an audio processing unit 650, which may be configured to communicate to various external devices such as a display or speakers via one or more A/V ports 652. Example peripheral interfaces 644 include a serial interface controller 654 or a parallel interface controller 656, which may be configured to communicate with external devices such as input devices (e.g., keyboard, mouse, pen, voice input device, touch input device, etc.) or other peripheral devices (e.g., printer, scanner, etc.) via one or more I/O ports 658. An example communication device 646 includes a network controller 660, which may be arranged to facilitate communications with one or more other computing devices 662 over a network communication link via one or more communication ports 664.

[0056] The network communication link may be one example of a communication media. Communication media may typically be embodied by computer readable instructions, data structures, program modules, or other data in a modulated data signal, such as a carrier wave or other transport mechanism, and may include any information delivery media. A "modulated data signal" may be a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media may include wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, radio frequency (RF), microwave, infrared (IR) and other wireless media. The term computer readable media as used herein may include both storage media and communication media.

[0057] Computing device 600 may be implemented as a portion of a small-form factor portable (or mobile) electronic device such as a cell phone, a personal data assistant (PDA), a personal media player device, a wireless web-watch device, a personal headset device, an application specific device, or a hybrid device that include any of the above functions. Computing device 600 may also be implemented as a personal computer including both laptop computer and non-laptop computer configurations.

[0058] The present disclosure is not to be limited in terms of the particular embodiments described in this application, which are intended as illustrations of various aspects. Many modifications and variations can be made without departing from its spirit and scope, as will be apparent to those skilled in the art. Functionally equivalent methods and apparatuses within the scope of the disclosure, in addition to those enumerated herein, will be apparent to those skilled in the art from the foregoing descriptions. Such modifications and variations are intended to fall within the scope of the appended claims. The present disclosure is to be limited only by the terms of the appended claims, along with the full scope of equivalents to which such claims are entitled. It is to be understood that this disclosure is not limited to particular methods, reagents, compounds, compositions or biological systems, which can, of course, vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only, and is not intended to be limiting.

[0059] With respect to the use of substantially any plural and/or singular terms herein, those having skill in the art can translate from the plural to the singular and/or from the singular to the plural as is appropriate to the context and/or application. The various singular/plural permutations may be expressly set forth herein for sake of clarity.

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (*e.g.*, bodies of the appended claims) are generally intended as "open" terms (*e.g.*, the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (*e.g.*, "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (*e.g.*, the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention

analogous to "at least one of A, B, or C, etc." is used, in general such a construction is intended in the sense one having skill in the art would understand the convention (*e.g.*, "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

[0061] In addition, where features or aspects of the disclosure are described in terms of Markush groups, those skilled in the art will recognize that the disclosure is also thereby described in terms of any individual member or subgroup of members of the Markush group.

[0062] As will be understood by one skilled in the art, for any and all purposes, such as in terms of providing a written description, all ranges disclosed herein also encompass any and all possible subranges and combinations of subranges thereof. Any listed range can be easily recognized as sufficiently describing and enabling the same range being broken down into at least equal halves, thirds, quarters, fifths, tenths, etc. As a non-limiting example, each range discussed herein can be readily broken down into a lower third, middle third and upper third, etc. As will also be understood by one skilled in the art all language such as "up to," "at least," and the like include the number recited and refer to ranges which can be subsequently broken down into subranges as discussed above. Finally, as will be understood by one skilled in the art, a range includes each individual member. Thus, for example, a group having 1-3 cells refers to groups having 1, 2, or 3 cells. Similarly, a group having 1-5 cells refers to groups having 1, 2, 3, 4, or 5 cells, and so forth.

[0063] From the foregoing, it will be appreciated that various embodiments of the present disclosure have been described herein for purposes of illustration, and that various modifications may be made without departing from the scope and spirit of the present disclosure. Accordingly, the various

embodiments disclosed herein are not intended to be limiting, with the true scope and spirit being indicated by the following claims.

CLAIMS

What is claimed is:

1. A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. The method of Claim 1, further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. The method of Claim 1, further comprising:

receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. The end device of Claim 11, wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. A computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

22. The computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. The computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. The computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

FIG. 1

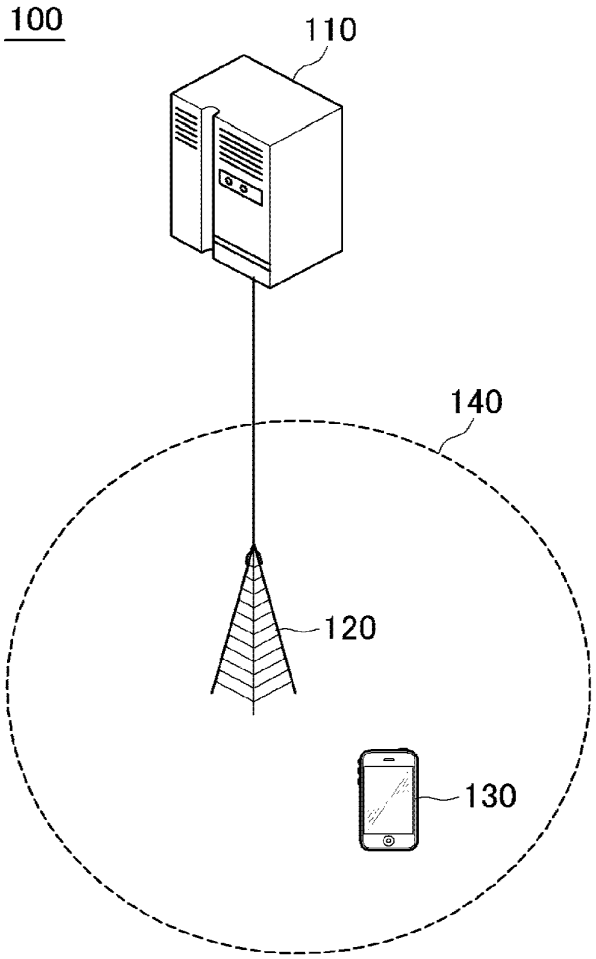


FIG. 2

200

ACCESS POINT	MAC ADDRESS	SSID
AUTHENTICATED ACCESS POINT 1	xxx111yyy	zzz
AUTHENTICATED ACCESS POINT 2	zzz222xxx	yyy
...	...	...

FIG. 3

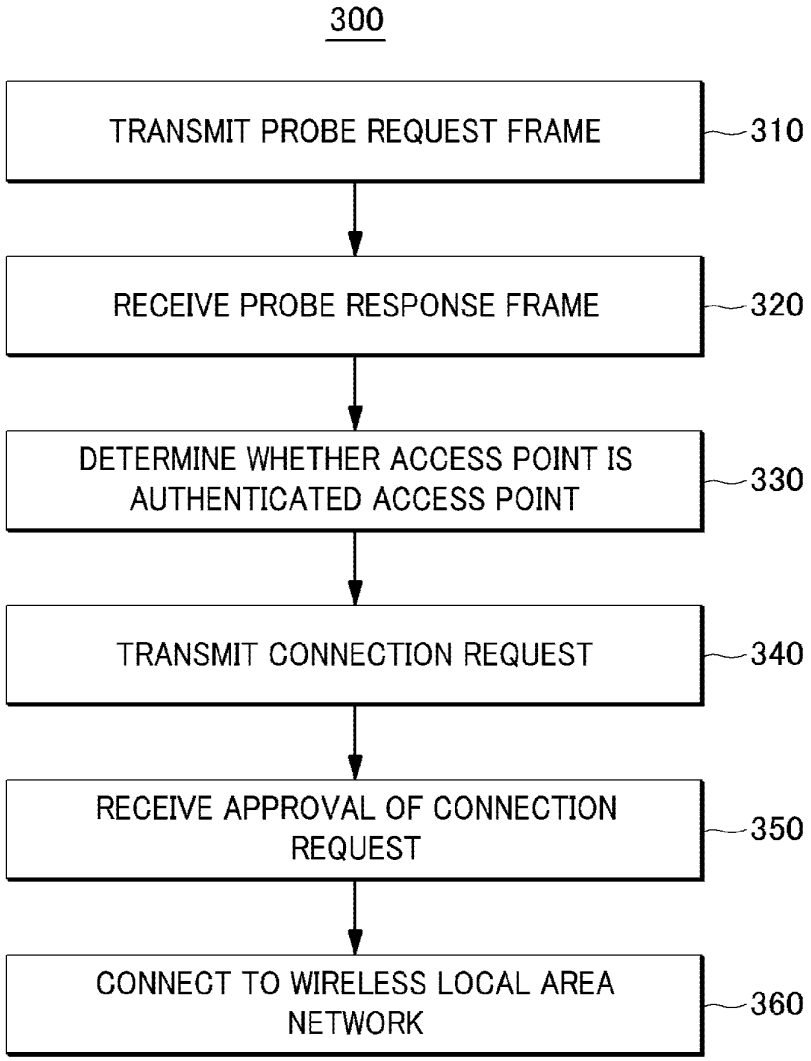

300
TRANSMIT PROBE REQUEST FRAME
310
RECEIVE PROBE RESPONSE FRAME
320
DETERMINE WHETHER ACCESS POINT IS AUTHENTICATED ACCESS POINT
330
TRANSMIT CONNECTION REQUEST
340
RECEIVE APPROVAL OF CONNECTION REQUEST
350
CONNECT TO WIRELESS LOCAL AREA NETWORK
360

FIG. 4

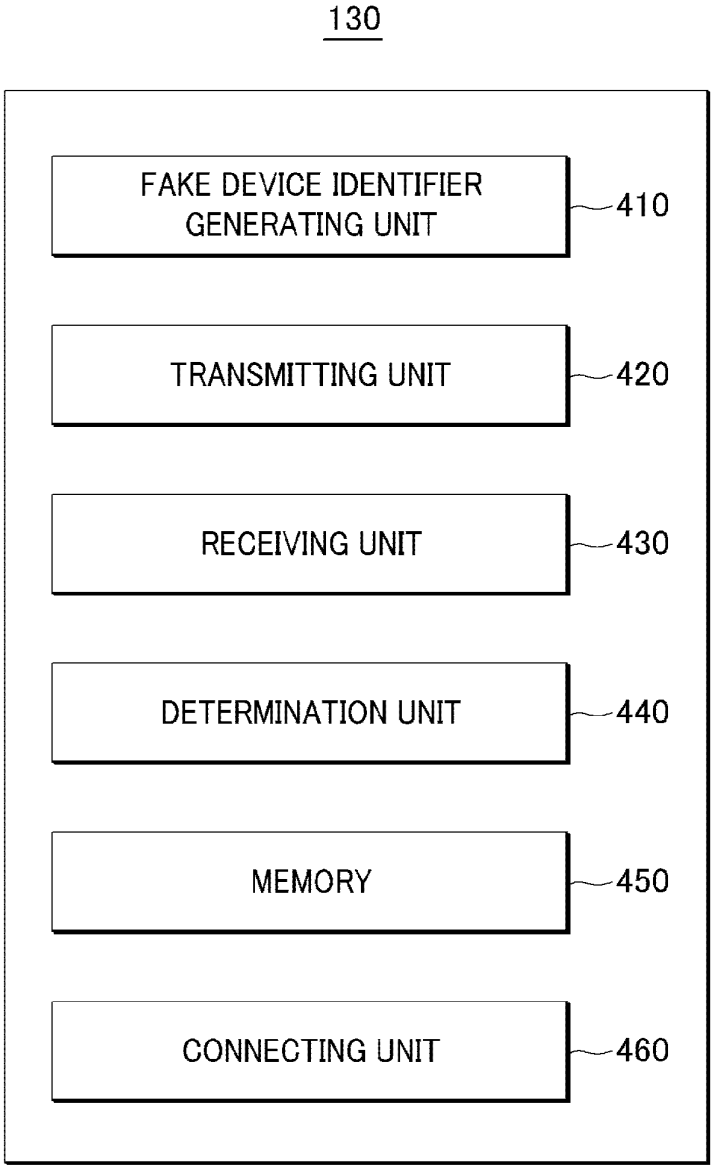

130
FAKE DEVICE IDENTIFIER GENERATING UNIT
410
TRANSMITTING UNIT
420
RECEIVING UNIT
430
DETERMINATION UNIT
440
MEMORY
450
CONNECTING UNIT
460

FIG. 5

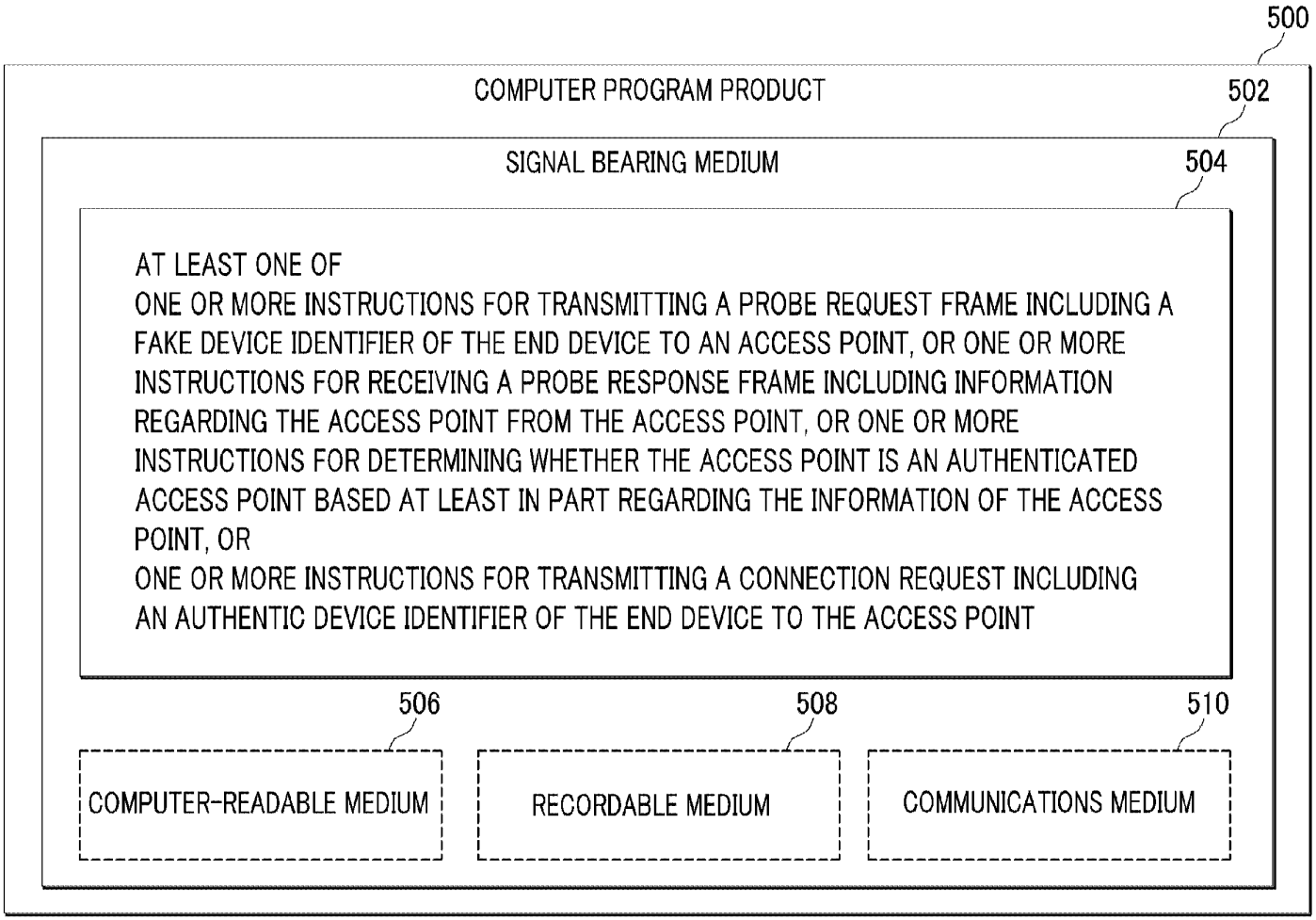
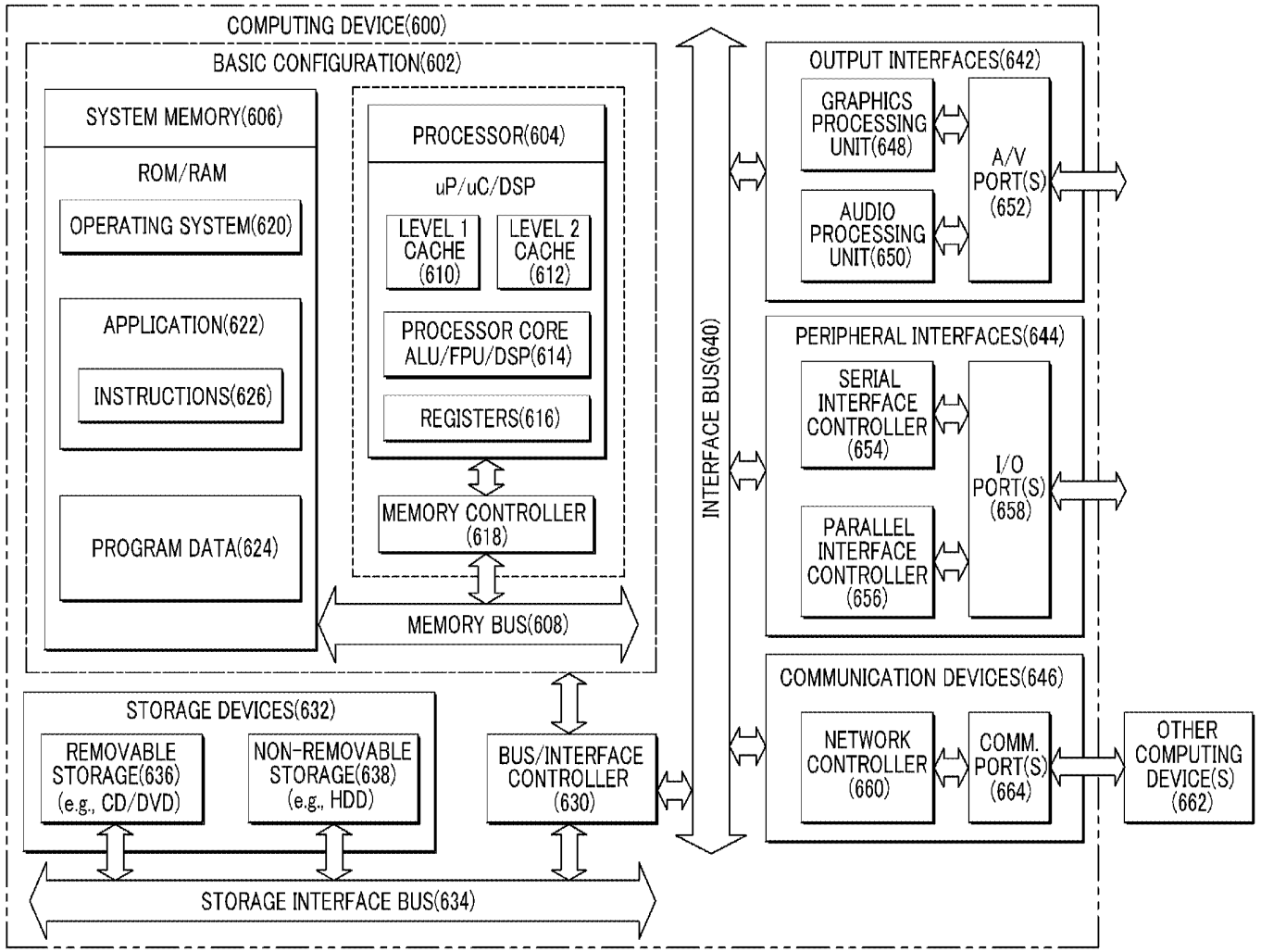

500
COMPUTER PROGRAM PRODUCT
502
SIGNAL BEARING MEDIUM
504
AT LEAST ONE OF
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A PROBE REQUEST FRAME INCLUDING A FAKE DEVICE IDENTIFIER OF THE END DEVICE TO AN ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR RECEIVING A PROBE RESPONSE FRAME INCLUDING INFORMATION REGARDING THE ACCESS POINT FROM THE ACCESS POINT, OR ONE OR MORE INSTRUCTIONS FOR DETERMINING WHETHER THE ACCESS POINT IS AN AUTHENTICATED ACCESS POINT BASED AT LEAST IN PART REGARDING THE INFORMATION OF THE ACCESS POINT, OR
ONE OR MORE INSTRUCTIONS FOR TRANSMITTING A CONNECTION REQUEST INCLUDING AN AUTHENTIC DEVICE IDENTIFIER OF THE END DEVICE TO THE ACCESS POINT
506
508
510
COMPUTER-READABLE MEDIUM
RECORDABLE MEDIUM
COMMUNICATIONS MEDIUM

FIG. 6


COMPUTING DEVICE(600)
BASIC CONFIGURATION(602)
SYSTEM MEMORY(606)
ROM/RAM
OPERATING SYSTEM(620)
APPLICATION(622)
INSTRUCTIONS(626)
PROGRAM DATA(624)
PROCESSOR(604)
uP/uC/DSP
LEVEL 1 CACHE (610)
LEVEL 2 CACHE (612)
PROCESSOR CORE ALU/FPU/DSP(614)
REGISTERS(616)
MEMORY CONTROLLER (618)
MEMORY BUS(608)
INTERFACE BUS(640)
OUTPUT INTERFACES(642)
GRAPHICS PROCESSING UNIT(648)
AUDIO PROCESSING UNIT(650)
A/V PORT(S) (652)
PERIPHERAL INTERFACES(644)
SERIAL INTERFACE CONTROLLER (654)
PARALLEL INTERFACE CONTROLLER (656)
I/O PORT(S) (658)
COMMUNICATION DEVICES(646)
NETWORK CONTROLLER (660)
COMM. PORT(S) (664)
OTHER COMPUTING DEVICE(S) (662)
STORAGE DEVICES(632)
REMOVABLE STORAGE(636) (e.g., CD/DVD)
NON-REMOVABLE STORAGE(638) (e.g., HDD)
BUS/INTERFACE CONTROLLER (630)
STORAGE INTERFACE BUS(634)

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United States Patent and Trademark Office
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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U.S. APPLICATION NUMBER NO.	FIRST NAMED INVENTOR	ATTY. DOCKET NO.
13/885,754	Hyoung-Gon Lee	2582.737BS

86636
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

INTERNATIONAL APPLICATION NO.	
PCT/US12/66306	
I.A. FILING DATE	PRIORITY DATE
11/21/2012	

CONFIRMATION NO. 1482
371 ACCEPTANCE LETTER

OC000000065021850

Date Mailed: 11/19/2013

NOTICE OF ACCEPTANCE OF APPLICATION UNDER 35 U.S.C 371 AND 37 CFR 1.495

The applicant is hereby advised that the United States Patent and Trademark Office, in its capacity as a Designated / Elected Office (37 CFR 1.495), has ACCEPTED the above identified international application for national patentability examination in the United States Patent and Trademark Office.

The United States Application Number assigned to the application is shown above. A Filing Receipt will be issued for the present application in due course. **THE DATE APPEARING ON THE FILING RECEIPT AS THE "FILING DATE or 371(c) DATE" IS THE DATE ON WHICH THE LAST OF THE 35 U.S.C. 371 (c)(1) and (c)(2) REQUIREMENTS HAS BEEN RECEIVED IN THE OFFICE. THIS DATE IS SHOWN BELOW.** The filing date of the above identified application is the international filing date of the international application (Article 11(3) and 35 U.S.C. 363)

05/16/2013
DATE OF RECEIPT OF 35 U.S.C.
371(c)(1) and (c)(2) REQUIREMENTS

The following items have been received:

- Copy of the International Application filed on 05/16/2013
- Copy of the International Search Report filed on 05/16/2013
- Information Disclosure Statements filed on 05/16/2013
- Inventor's Oath or Declaration filed on 05/16/2013
- Request for Immediate Examination filed on 05/16/2013
- U.S. Basic National Fees filed on 05/16/2013
- Assignee Statement for PGPUB filed on 05/16/2013
- Power of Attorney filed on 05/16/2013
- Authorization to Permit Access filed on 05/16/2013
- Application Data Sheet (37 CFR 1.76) filed on 05/16/2013

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

DEBORAH A THOMAS

Telephone: (571) 272-7175

PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 13/885,754

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	280
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A			N/A	120
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	720
TOTAL CLAIMS (37 CFR 1.16(i))	24 minus 20 =	* 4			OR	x 80 =	320
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*				x 420 =	0.00
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1440

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
13/885,754	05/16/2013		1440	2582.737BS	24	3

CONFIRMATION NO. 1482

86636
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

FILING RECEIPT



Date Mailed: 11/19/2013

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Hyoung-Gon Lee, Seoul, KOREA, REPUBLIC OF;

Applicant(s)

EMPIRE TECHNOLOGY DEVELOPMENT LLC, Wilmington, DE

Assignment For Published Patent Application

Empire Technology Development LLC, Wilmington, DE

Power of Attorney: The patent practitioners associated with Customer Number 86636

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/US12/66306 11/21/2012

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 11/15/2013
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/885,754**
Projected Publication Date: 05/22/2014
Non-Publication Request: No
Early Publication Request: No

Title

SCHEMES FOR CONNECTING TO WIRELESS NETWORK

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at http://www.uspto.gov/web/offices/pac/doc/general/index.html.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, http://www.stopfakes.gov. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign AssetsControl, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit http://www.SelectUSA.gov or call +1-202-482-6800.

MULTIPLE DEPENDENT CLAIM FEE CALCULATION SHEET

Substitute for Form PTO-1360
(For use with Form PTO/SB/06)

Application Number	Filing Date
13885754	

Applicant(s) Hyoung-Gon LEE

* May be used for additional claims or amendments

CLAIMS	AS FILED		AFTER FIRST AMENDMENT		AFTER SECOND AMENDMENT	
	Indep	Depend	Indep	Depend	Indep	Depend
1	1					
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Total Indep	3		0		0	
Total Depend	21	↵	0	↵	0	↵
Total Claims	24		0		0	

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS

CONFIRMATION NO. 1482

86636
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

PUBLICATION NOTICE

OC000000068594057

Title:SCHEMES FOR CONNECTING TO WIRELESS NETWORK

Publication No.US-2014-0140331-A1
Publication Date:05/22/2014

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently http://www.uspto.gov/patft/.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently http://pair.uspto.gov/. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Managment, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 10/22/2014

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
HAN, CLEMENCE S	
ART UNIT	PAPER NUMBER
2414	
MAIL DATE	DELIVERY MODE
10/22/2014	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *11/21/2012*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-24* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-24* is/are rejected.

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

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 101

1. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 20-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim recites "computer-readable storage medium" After close inspection, the examiner respectfully notes that the disclosure, as a whole, does not specifically identify what may be included as a computer-readable storage medium and what is not to be included as a computer-readable storage medium. An examiner is obliged to give claims their broadest reasonable interpretation consistent with the specification during examination. The broadest reasonable interpretation of a claim drawn to a computer-readable storage medium (also called machine readable medium and other such variations) typically covers forms of non-transitory tangible media and transitory propagating signals *per se* in view of the ordinary and customary meaning of computer readable media, particularly when the specification is silent. See MPEP 2111.01. When the broadest reasonable interpretation of a claim covers a signal, *per se*, the claim must be rejected under 35 U.S.C. § 101 as covering non-statutory subject matter. Therefore, given the silence of the disclosure and the broadest reasonable interpretation, the computer-readable

storage medium of the claim may include transitory propagating signals. As a result, the claim pertains to non-statutory subject matter.

However, the Examiner respectfully submits a claim drawn to such a computer-readable storage medium that covers both transitory and non-transitory embodiments may be amended to narrow the claim to cover only statutory embodiments to avoid a rejection under 35 U.S.C. § 101 by adding the limitation "non-transitory" to the claim. Such an amendment would typically not raise the issue of new matter, even when the specification is silent because the broadest reasonable interpretation relies on the ordinary and customary meaning that includes signals *per se*. For additional information, please see the Patents' Official Gazette notice published February 23, 2010 (1351 OG 212).

Claim Rejections - 35 USC § 102

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

3. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-6, 8-13 and 15-24 are rejected under pre-AIA 35 U.S.C. 102 (b) as being anticipated by Sinha et al. (US Pub. 2008/0052779).

Regarding claims 1 and 20, Sinha teaches a method performed under control of an end device (wireless client devices 425; APs 405 and/or clients 425 can occasionally operate as sensors 601 and communicate data, events, and statistics to the server(s) 602, para. [0061], [0068]), comprising: transmitting, to an access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), a probe request frame (send out probe request frames to seek out other IEEE 802.11 devices available for association, para. [0034]) including a fake device identifier for the end device (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9); receiving, from the access point (AP 405), a probe response frame (injection protection can create random frames and transmit the random frames obscure the real frames; AP transmits random frames C, D among the transmission of frames 8 through 14, para. [0078], [0082], [0083]) including information regarding the access point (transmission of frames 1 through 7, para. [0075], [0082], [0083]); determining whether the access point (AP 405/sensor 601) is an authenticated access point based at least in part on the information regarding the access point (clients 425-3, 425-4 can filter out and ignore the random, fake frames, para. [0082]); and transmitting, to the access point, a connection request including an authentic device identifier (Client

425-3 transmits frames 1 through 7 to an AP 405, para. [0082]) for the end device (deauthentication frames and disassociation frames are exchanged during normal wireless roaming and association between a station and an access point, para. [0063], [0065]).

Regarding claims 2 and 21, Sinha further teaches receiving, from the access point, an approval of the connection request (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]); and connecting to a wireless local area network provided by the access point (network 401 can include an internet protocol (IP) network. The wireless network 400 includes multiple wireless client devices 425 operable to connect to the AP 405 through a wireless link. Wireless client devices 425 can include laptop and desktop computers as well as other wireless-enable devices, para. [0061]).

Regarding claims 3, 18 and 24, Sinha further teaches wherein the access point includes a Wi-Fi access point (access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9), and the wireless local area network provided by the access point include a Wi-Fi network (IEEE 802.11 network, para. [0039]).

Regarding claims 4 and 19, Sinha further teaches wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device (WLAN network 600 equipped with sensors 601 and server(s) 602, para. [0067], Fig. 6).

Regarding claims 5, 12 and 22, Sinha further teaches generating the fake device identifier before transmitting the probe request frame (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9).

Regarding claims 6 and 13, Sinha further teaches receiving the fake device identifier from a mobile operating server (sensor 601/access point (AP) 405; wireless network 400 can include an access point (AP) 405 connected to a router 410 which connects to a network 401 and is protected by a firewall 420, para. [0061], Fig. 1, 9) before transmitting the probe request frame (initial handshake between the device and AP by simulating fake handshakes when the real devices are already connected with proper handshakes, para. [0075]).

Regarding claims 8, 15 and 23, Sinha further teaches wherein the authentic device identifier includes a media access control (MAC) address (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]).

Regarding claim 9, Sinha further teaches receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Regarding claims 10 and 17, Sinha further teaches wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point (SSIDs and MAC addresses act as personal identification variables for verifying the identity of authorized clients, para. [0038]), and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Regarding claim 11, Sinha teaches an end device (wireless client devices 425, para. [0061]), comprising: a transmitting unit configured to transmit, to an access point (APs 405 and/or clients 425 can occasionally operate as sensors 601 and communicate data, events, and statistics to the server(s) 602, para. [0068], Fig. 1, 9), a probe request frame (send out probe request frames to seek out other IEEE 802.11 devices available for association, para. [0034]) including a fake device identifier (transmit random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames, para. [0059], [0077], [0078], [0082], [0083], Fig. 9); a receiving unit (clients 425) configured to receive, from the access point, a probe response frame (injection protection can create random frames and transmit the random frames obscure the real frames; AP transmits random frames C, D among the transmission of frames 8 through 14, para. [0078], [0082], [0083]) including information regarding the access point (transmission of frames

1 through 7, para. [0075], [0082], [0083]); a memory configured to store an authenticated access point list including information regarding at least one authenticated access point (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]); a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list (clients 425-3, 425-4 can filter out and ignore the random, fake frames, para. [0082]); and a connecting unit configured to connect to a wireless local area network provided by the access point (offering a wireless connection to the Internet, para. [0038]), wherein the transmitting unit is further configured to transmit, to the access point a connection request including an authentic device identifier (Client 425-3 transmits frames 1 through 7 to an AP 405, para. [0082]), and the receiving unit is further configured to receive, from the access point, an approval of the connection request (deauthentication frames and disassociation frames are exchanged during normal wireless roaming and association between a station and an access point, para. [0063], [0065]).

Regarding claim 16, Sinha teaches determine whether the information regarding the access point is included in the authenticated access point list (secure their WLAN by using an authorized list of station MAC addresses for authentication (e.g., MAC filtering), para. [0038]).

Claim Rejections - 35 USC § 103

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

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

6. Claims 7 and 14 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Sinha et al. in view of Gopinath et al. (US Pub. 2011/0083165).

Regarding claims 7 and 14, Sinha teaches all the limitations cited in claim 1 and claim 11. Sinha, however, does not teach the fake device identifier includes at least one of a random number or a random character. Gopinath teaches the fake device identifier (fake beacon packets from the sniffer with the AP's address as the source address, para. [0120]) includes at least one of a random number or a random character (ACK collision can be inflicted by a number of ways including, but not limited to, transmitting misformed ACK packet or ACK packet with random bits, para. [0112]). It would have been obvious to one skilled in the art to modify Sinha to have the fake device identifier includes at least one of a random number or a random character as taught by Gopinath in order to further secure the wireless network protection system of Sinha with geographical detection (see Gopinath para. [0008], [0011]).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

Notice of References Cited	Application/Control No. 13/885,754	Applicant(s)/Patent Under Reexamination LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2008/0052779 A1	02-2008	Sinha et al.	726/22
*	B	US-2009/0235077 A1	09-2009	Cam Winget et al.	713/171
*	C	US-2011/0083165 A1	04-2011	Gopinath et al.	726/4
*	D	US-2012/0210395 A1	08-2012	CAM WINGET et al.	726/3
*	E	US-2012/0311328 A1	12-2012	Wang et al.	713/168
*	F	US-2013/0179943 A1	07-2013	Sun et al.	726/3
*	G	US-2013/0281056 A1	10-2013	Abraham et al.	455/411
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
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	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

PTO/SB/08a (01-10)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Not for submission under 37 CFR 1.99)

Application Number	
Filing Date	2013-05-16
First Named Inventor	Lee, Hyoung-Gon
Art Unit	
Examiner Name	
Attorney Docket Number	2582.737BS

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	7808958	B1	2010-10-05	Hernacki et al	
	2	7185204	B2	2007-02-27	Narayanaswami et al	
	3	8005458	B2	2011-08-23	Baik et al	

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Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20080052779	A1	2008-02-28	Sinha et al	
	2	20110083165	A1	2011-04-07	Gopinath et al	
	3	20110314147	A1	2011-12-22	Whelan et al	

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /C.H./

Receipt date: 05/16/2013	Application Number	13885754 - GAU: 2414
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

	4	20080043686	A1	2008-02-21	Sperti et al	
	5	20070286143	A1	2007-12-13	Olson et al	
	6	20030221006	A1	2003-11-27	Kuan et al	
	7	20120221955	A1	2012-08-30	Raleigh et al	

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Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1	International Search Report from International Application No.: PCT/US12/66306 mailed Feb. 8, 2013.	☐
	2	Singelee, et al., "Enabling Location Privacy in Wireless Personal Area Networks", 20 pages, 2006.	☐

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Receipt date: 05/16/2013	Application Number	13885754 - GAU: 2414
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

	3	Gruteser, et al., "Enhancing Location Privacy in Wireless LAN Through Disposable Interface Identifiers: A Quantitative Analysis", Sept. 19, 2003, 10 pages.	☐

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EXAMINER SIGNATURE

Examiner Signature	/Clemence Han/	Date Considered	10/20/2014

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

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

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Receipt date: 05/16/2013	Application Number	13885754 - GAU: 2414
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)	Filing Date	2013-05-16
	First Named Inventor	Lee, Hyoung-Gon
	Art Unit	
	Examiner Name	
	Attorney Docket Number	2582.737BS

CERTIFICATION STATEMENT

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

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

OR

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

☐ See attached certification statement.

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

☒ A certification statement is not submitted herewith.

SIGNATURE

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

Signature	/David S. Lee/	Date (YYYY-MM-DD)	2013-05-16
Name/Print	David S. Lee	Registration Number	38222

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

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

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

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

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

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

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

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

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

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

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CONFIRMATION NO. 1482

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
13/885,754	05/16/2013 RULE	370	2414	2582.737BS

APPLICANTS

EMPIRE TECHNOLOGY DEVELOPMENT LLC, Wilmington, DE, Assignee (with 37 CFR 1.172 Interest);

INVENTORS

Hyoung-Gon Lee, Seoul, KOREA, REPUBLIC OF;

**** CONTINUING DATA ***************************

This application is a 371 of PCT/US12/66306 11/21/2012

**** FOREIGN APPLICATIONS ***************************

**** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ****

11/15/2013

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☑ No	/CLEMENCE S HAN/ Examiner's Signature	☐ Initials	KOREA, REPUBLIC OF	6	24	3

ADDRESS

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314
UNITED STATES

TITLE

SCHEMES FOR CONNECTING TO WIRELESS NETWORK

FILING FEE RECEIVED		
1440	FEES: Authority has been given in Paper No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
L3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
L4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
L5	9	3 and 4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
L6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
L7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
L8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
L9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
L10	248	9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
L11	240	10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
L12	101	10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
L13	244	11 12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
L14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
L15	39	"probe request" and "probe response" and 13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
L16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40

L17	7	14 16	US-PGPUB	OR	ON	2014/10/20 01:41
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34

10/20/2014 1:49:04 AM
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Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
Inventorship ..... Hyoung-Gon Lee
Group Art Unit 2414
Examiner ..... HAN, CLEMENCE S
Attorney Docket No. 2582.737BS
Title: ..... SCHEMES FOR CONNECTING TO WIRELESS NETWORK

RESPONSE TO NON-FINAL OFFICE ACTION OF OCTOBER 22, 2014

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Madam:

In response to the Non-final Office Action dated October 22, 2014, for which the three-month shortened statutory period for response is set to expire on January 22, 2015, the following amendments and remarks are respectfully submitted. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

An **Amendment to the Specification** is set forth on page 3.

A **Listing of the Claims** begins on page 4.

Remarks begin on page 10.

AMENDMENT TO THE SPECIFICATION

Please replace paragraph [0034] with the following amended paragraph:

[0034] At block 340 (Transmit Connection Request), end device 130 may transmit a connection request including an authentic device identifier for end device 130 to access point 120 which is recognized as the authenticated access point at block 330. By way of example, but not limitation, the authentic device identifier may include an ~~origianl~~ original MAC address of end device 130. Processing may proceed from block 340 to block 350.

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims pending:

- At time of the Action: **Claims 1-24**
- After this Reply: **Claims 1-24**

Currently Canceled or Withdrawn Claims: None

Currently Amended Claims: **Claims 20-24**

New Claims: None

1. (**Original**) A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. (**Original**) The method of Claim 1**,** further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (**Original**) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. (**Original**) The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. (**Original**) The method of Claim 1**,** further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. (**Original**) The method of Claim 1**,** further comprising:

receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. (**Original**) The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. (**Original**) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (**Original**) The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. (**Original**) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (**Original**) An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. (**Original**) The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. (**Original**) The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. (**Original**) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (**Original**) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (**Original**) The end device of Claim 11, wherein the determination unit further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. (**Original**) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (**Original**) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (**Original**) The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. (**Currently Amended**) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. (**Currently Amended**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and connecting to a wireless local area network provided by the access point.

22. (**Currently Amended**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. (**Currently Amended**) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (**Currently Amended**) The non-transitory computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-24 are pending. **Claims 20-24** were rejected under 35 U.S.C. § 101. **Claims 1-6, 8-13 and 15-24** were rejected under 35 U.S.C. § 102(b). **Claims 7 and 14** were rejected under 35 U.S.C. § 103(a).

Claims 20-24 are amended. No new matter is added.

INTERVIEW

Applicant's representative thanks the Examiner for the courtesies extended during the personal interview held on January 20, 2015. During the interview, it was agreed that independent **Claims 1, 11, and 20** (and consequently dependent **Claims 2-10, 12-19, and 21-24**) are patentably distinguishable from the applied art.

CLAIM REJECTION UNDER 35 U.S.C. § 101

Claims 20-24 *are rejected under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter.*

To address this rejection, Applicant has amended **Claims 20-24** to insert non-transitory before "computer-readable storage medium" as suggested by the Examiner. The rejection is thus rendered moot. Notwithstanding this amendment, Applicant submits that the use of "non-transitory" is to be understood to remove only propagating transitory signals per se from the claim scope and does not relinquish rights to all standard computer-readable storage media that are not only propagating transitory signals per se. In other words, the meaning of "non-transitory computer-readable storage medium" should be construed to exclude only those types of transitory computer-readable media which were found in *In re Nuijten* (500 F.3d 1346 (Fed.Cir. 2007), *reh'g denied*, 515 F.3d 1361 (Fed.Cir. 2008))

to fall outside the scope of patentable subject matter under 35 U.S.C. § 101.

CLAIM REJECTION UNDER 35 U.S.C. § 102(b)

Claims 1-6, 8-13 and 15-24 *are rejected under pre-AIA 35 U.S.C. § 102(b) as allegedly being anticipated by Sinha et al. (U.S. Publication No. 2008/0052779; hereafter "Sinha").*

Applicant respectfully traverses this rejection and requests reconsideration and withdrawal.

Sinha appears to describe "systems and methods for protecting wireless networks from attempts to break encryption or authentication and from attacks such as reconnaissance, sniffing, denial-of-service, and masquerade attacks." The rejection alleges that Sinha discloses, "transmitting, to an access point, a probe request frame including a fake device identifier for the end device" as claimed in **Claim 1**. Sinha, however, does not in fact disclose the use of a fake device identifier, as acknowledged by the Examiner during the interview.

For example, the rejection specifically points to paragraphs [0059], [0077], [0078], [0082], [0083] and Fig. 9, alleging that the fake device identifier is met by the disclosure of "transmit[ting] random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase on a wireless network; e.g. chaff frames, fake frames, random frames." Paragraphs [0059], [0082], and [0083] are reproduced below (emphasis added):

> **[0059]** This disclosure provides systems and methods for ***protecting the existing WEP and WPA encryption methods***. For WEP protection, ***random traffic is simulated*** to override the inherent weak vulnerability built into the WEP encryption algorithm. By simulating truly random traffic, you can prevent attackers from acquiring enough data to brute force or mathematically attack the WEP encryption algorithm. The effort required for a hacker to break the WEP keys increases by simulating traffic that mimics valid data but increases the IV keyspace. The chaffing technique is the method of simulating valid packets that pass all validity checks but contain an IV that is different but logically correct and in sequence so that an attacker would be able to filter invalid packets. ***These false packets can cause enough of a jitter in the decryption routine to throw off cracking algorithm and make the decryption difficult***.

> **[0082]** FIG. 9 illustrates an example embodiment of the present disclosure to transmit ***random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase*** on a wireless network. Client 425-3 transmits frames 1 through 7 to an AP 405, but a sensor 601 transmits random frames A, B among the transmission of frames 1 through 7. Additionally, Client 425-4 transmits frame 8 through 14 and the AP also transmits random frames C, D among the transmission of frames 8 through 14. ***The clients 425-3, 425-4 can filter out and ignore the random, fake frames. However, a rogue device 430 cannot differentiate between valid and random fake frames.***
>
> **[0083]** The rogue device 430 sniffs the transmitted frames including the valid frames 1-14 and the random, fake frames A, B, C, D. The rogue device 430 uses all sniffed frames for decrypting the WEP key or WPA passphrase. Here, ***the random, fake frames A, B, C, D can throw off the decryption*** such that the rogue device cannot break the WEP key or WPA passphrase. On WEP protected networks, the random, ***fake frames are specially crafted to look like valid data with a different encryption key***. For WPA protected networks, ***the handshakes (i.e. EAPOL management frames) are forged instead of the data frames***.

As noted above, the rejection alleges that these passages disclose "transmitting, to an access point, a probe request frame including a fake device identifier for the end device." In fact, however, paragraph [0059] discloses: "systems and methods for ***protecting the existing WEP and WPA encryption methods***" and, "[f]or WEP protection, ***random traffic is simulated***." Furthermore, paragraph [0082] discloses: "FIG. 9 illustrates an example embodiment of the present disclosure to transmit ***random, fake frames along with valid frames to prevent decryption of the WEP key or WPA passphrase*** on a wireless network," wherein "the random, fake frames ***are specially crafted to look like valid data with a different encryption key***" on WEP protected networks and "***handshakes (i.e. EAPOL management frames) are forged instead of the data frames***" for WPA protected networks, per paragraph [0083] (emphasis added). Thus, Sinha does not disclose "transmitting ... a probe request frame ***including a fake device identifier***" as recited in **Claim 1,** but instead discloses simulating random traffic using ***random, fake frames along with valid frames***. Sinha never suggests to use a fake device identifier.

Failing to disclose "transmitting ... a probe request frame including a fake device identifier," Sinha does not disclose every feature of **Claim 1**. Therefore, the rejection under 35 U.S.C. § 102(b)

cannot be sustained. Furthermore, independent **Claims 11 and 20** respectively recite (emphasis added), "An end device, comprising: a transmitting unit configured to transmit, to an access point, ***a probe request frame including a fake device identifier***;" and "A computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising: transmitting, to an access point, ***a probe request frame including a fake device identifier*** of the end device." Accordingly, by arguments similar to those advanced above, **Claims 11 and 20** are also patentably distinguishable from Sinha.

In addition, **Claims 2-6, 8-10, 12-13, 15-19, and 21-24** are dependent claims that inherit the patentability of the independent claim from which each is respectively derived and are thus patentable at least on that basis.

Therefore, at least for the reasons advanced above, Applicant respectfully submits that **Claims 1-6, 8-13, and 15-24** are patentable over the teachings of Sinha. Accordingly, reconsideration and withdrawal of the rejection of these claims is respectfully requested.

CLAIM REJECTION UNDER 35 U.S.C. § 103(a)

Claims 7 and 14 *are rejected as allegedly being unpatentable over Sinha, in view of Gopinath et al. (U.S. Publication No. 2011/0083165; hereafter "Gopinath").*

Claims 7 and 14 are dependent claims that inherit the patentability of independent **Claims 1 and 11** from which each is respectively derived and are thus patentable at least on that basis. Therefore reconsideration and withdrawal of the rejection of these claims is also respectfully requested.

CONCLUSION

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and therefore early and forthright issuance of a Notice to that effect is earnestly solicited.

Respectfully submitted,

Brundidge & Stanger, PC

Dated: January 21, 2015

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

Electronic Acknowledgement Receipt

EFS ID:	21260908
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger
Filer Authorized By:	
Attorney Docket Number:	2582.737BS
Receipt Date:	21-JAN-2015
Filing Date:	16-MAY-2013
Time Stamp:	16:22:58
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	KR-839496-02-US-NAT_20150121_OA_Response.pdf	112867 5f689c0ab188d1b44f0b678facca64d78f209f20	no	14

Warnings:	
Information:	

Total Files Size (in bytes):	112867

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

New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/885,754	Filing Date 05/16/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **01/21/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 24	Minus	** 24	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TONYA MCBRIDE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 01/28/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
01/28/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/885,754	LEE, HYOUNG-GON	
	Examiner	Art Unit	
	CLEMENCE HAN	2414	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CLEMENCE HAN*. (3)_____.

(2) *Daniel Stanger*. (4)_____.

Date of Interview: *20 January 2015*.

Type: ☐ Telephonic ☐ Video Conference
☒ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☒102 ☐103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1*.

Identification of prior art discussed: *Sinha et al. (US Pub. 2008/0052779)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant successfully explained the difference between the prior art and the claimed invention. 102 rejection would be withdrawn upon receiving a proper written response to the non-final rejection .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/CLEMENCE HAN/ Primary Examiner, Art Unit 2414	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

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NOTICE OF ALLOWANCE AND FEE(S) DUE

86636 7590 02/03/2015
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 02/03/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/04/2015

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

86636 7590 02/03/2015
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

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nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	05/04/2015

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAN, CLEMENCE S	2414	370-338000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 02/03/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
HAN, CLEMENCE S	

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 02/03/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *01/21/2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-24*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

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

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

DETAILED ACTION

The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

1. Claims 1-24 are allowed.

2. The following is an examiner's statement of reasons for allowance: The present invention is directed to a method for connecting to an authenticated access point.

3. Sinha et al. (US Pub. 2008/0052779) teaches determining whether the access point is an authenticated access point [0082].

4. The prior arts in the record fail to teach or make obvious to a method comprising transmitting, to an access point, a probe request frame including a fake device identifier for the end device within a structure of the claim. These features are claimed in the independent claims 1, 11 and 20 and render them allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	70	("probe request frame").clm.	USPAT; UPAD	OR	ON	2015/02/01 18:56

2/ 1/ 2015 7:00:35 PM
C:\ Users\ chan\ Documents\ EAST\ Workspaces\ 13885754.wsp

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
L4	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
L5	10351	h04w12/06.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
L6	8623	h04w84/12.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
L7	7411	h04w88/08.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
L8	31521	3 4 5 6 7	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
L10	581	"probe request frame" and 8	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
L11	1	"probe request frame" with fake and 8	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25

S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device identifier" "device id")	US-PGPUB; USPAT	OR	ON	2015/01/19 19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02

2/ 1/ 2015 7:00:24 PM
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Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

CPC						
Symbol					**Type**	**Version**
H04W		8	/	26	F	2013-01-01
H04W		48	/	20	I	2013-01-01
H04W		12	/	06	I	2013-01-01
H04W		84	/	12	A	2013-01-01
H04W		88	/	08	A	2013-01-01
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CPC Combination Sets							
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	24	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	02/01/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION	
CLASS	SUBCLASS	CLAIMED	NON-CLAIMED

CROSS REFERENCE(S)					
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)				

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	24	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	02/01/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 24	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414 (Primary Examiner)	02/01/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	see Interference Search printout	2/1/2015	ch

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
Inventorship ..... Hyoung-Gon LEE
Group Art Unit 2414
Examiner ..... Clemence S. Han
Attorney Docket No. 2582.737BS
Title: ..... SCHEMES FOR CONNECTING TO WIRELESS NETWORK

AMENDMENT UNDER 37 C.F.R. § 1.312

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Madam:

Subsequent to the Notice of Allowance dated February 3, 2015, in connection with the above-identified application, the following amendments and remarks are respectfully submitted. An explanation regarding the propriety of the Amendment is included within the Remarks section. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

Amendments to the Drawings appear on page 3.

Amendments to the Specification begin on page 4.

A **Listing of the Claims** begins on page 7.

An **Amendment to the Abstract** appears on page 13.

Remarks begin on page 14.

AMENDMENTS TO THE DRAWINGS

A replacement sheet is hereby submitted. The replacement sheet does not introduce any new matter.

In the replacement sheet of drawings, FIG. 6 is amended as follows:

- In Fig. 6, Sheet 6 of 6, delete "uP/uC/DSP" and insert - - µP/µC/DSP - -, therefor.

Attached: Replacement Sheet of Drawings

AMENDMENTS TO THE SPECIFICATION

Please insert the following paragraph immediately below the title on page 1 of the specification:

CROSS-REFERENCE TO RELATED APPLICATIONS

This Application is the National Stage filing under 35 U.S.C. § 371 of PCT Application Ser. No. PCT/US12/66306, filed on November 21, 2012.

Please replace paragraph [0048] with the following amended paragraph:

[0048] FIG. 5 illustrates computer program products that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. Program product 500 may include a signal bearing medium ~~510~~ 502. Signal bearing medium ~~510~~ 502 may include one or more instructions ~~520~~ 504 that, when executed by, for example, a processor, may provide the functionality described above with respect to FIGS. 1-4. By way of example, instructions ~~520~~ 504 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to FIG. 4, end device 130 may undertake one or more of the blocks shown in FIG. 3 in response to instructions ~~520~~ 504.

Please replace paragraph [0049] with the following amended paragraph:

[0049] In some implementations, signal bearing medium ~~510~~ 502 may encompass a computer-readable medium ~~530~~ 506, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium ~~510~~ 502 may encompass a recordable medium ~~540~~ 508, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium ~~510~~ 502 may encompass a communications medium ~~550~~ 510, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a wireless communication link, etc.). Thus, for example, program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium ~~520~~ 502, where the signal bearing medium ~~520~~ 502 is conveyed by a wireless communications medium ~~550~~ 510 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

Please replace paragraph [0053] with the following amended paragraph:

[0053] Computing device 600 may have additional features or functionality, and additional interfaces to facilitate communications between basic configuration 602 and any required devices and interfaces. For example, a bus/interface controller 630 may be used to facilitate communications between basic configuration 602 and one or more data storage devices 632 via a storage interface bus 634. Data storage devices 632 may be removable storage devices 636, non-removable storage devices 638, or a combination thereof. Examples of removable storage and non-removable storage devices include magnetic disk devices such as flexible disk drives and hard-disk drives (HDD), optical disk drives such as compact disk (CD) drives or digital versatile disk (DVD) drives, solid state drives (SSD), and tape drives to name a few. Example computer storage media may include volatile and non-volatile, removable and

non-removable media implemented in any method or technology for storage of information, such as computer readable instructions, data structures, program modules, or other data.

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims pending:

- At time of the Action: **Claims 1-24**
- After this Reply: **Claims 1-24**

Currently Canceled or Withdrawn Claims: None

Currently Amended Claims: **Claims 16 and 20**

New Claims: None

1. (**Original**) A method performed under control of an end device, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. (**Original**) The method of Claim 1**,** further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (**Original**) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. (**Original**) The method of Claim 2, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

5. (**Original**) The method of Claim 1**,** further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. (**Original**) The method of Claim 1**,** further comprising:

receiving the fake device identifier from a mobile operating server before transmitting the probe request frame.

7. (**Original**) The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. (**Original**) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (**Original**) The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. (**Original**) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (**Original**) An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. (**Original**) The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. (**Original**) The end device of Claim 11, wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server.

14. (**Original**) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (**Original**) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (**Currently Amended**) The end device of Claim 11, wherein the determination unit is further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. (**Original**) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (**Original**) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (**Original**) The end device of Claim 11, wherein the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device.

20. (**Currently Amended**) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

transmitting, to an access point, a probe request frame including a fake device identifier of the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part ~~regarding~~ on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and connecting to a wireless local area network provided by the access point.

22. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

AMENDMENT TO THE ABSTRACT

Please replace the Abstract with the following amended abstract:

ABSTRACT

Technology is disclosed for preventing classification of objects, e.g., in an augmented reality system. The technology can identify a set of objects to be classified, determine whether context information for one or more objects in the identified set of objects to be classified is identified as not to be employed during ~~classifiation~~ classification, and during classification of two different objects, include context information for one object but not the other.

REMARKS

The specification is amended to add information regarding the corresponding International application and to correct minor typographical errors. **Claims 16 and 20** are also amended to correct minor typographical errors. No additional search or examination is required and no new matter is added. Therefore, favorable consideration and entry of the amended specification and claims are respectfully requested.

Figure 6 is amended to provide a preferred symbol representing "micro." Entry of the amendments to Figure 6 is respectfully requested.

Comment on Statement of Reasons for Allowance

The Examiner's statement of reasons for allowance of the above-referenced patent application is acknowledged and it is agreed that the claimed subject matter is patentable. However, no position is taken regarding the reasons for allowance presented by the Examiner other than the positions that may have previously been taken during prosecution. Therefore, the Examiner's reasons for allowance should not be attributed as being an indication of the basis for the belief that the claims are patentable. Furthermore, it is respectfully asserted that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and no waiver of rights are made to such arguments by not further addressing such reasons herein.

Respectfully submitted,

Brundidge & Stanger, PC

Dated: April 1, 2015

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

Electronic Acknowledgement Receipt

EFS ID:	21940913
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger
Filer Authorized By:	
Attorney Docket Number:	2582.737BS
Receipt Date:	01-APR-2015
Filing Date:	16-MAY-2013
Time Stamp:	14:37:12
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Drawings-only black and white line drawings	KR-839496-02-US-NAT_20150401_Replacement_Sheet.pdf	202606 61014bf05640868264 4ea229bd41104116ed61ea	no	1

Warnings:	
Information:	

2	Amendment after Notice of Allowance (Rule 312)	KR-839496-02-US-NAT_20150401_Rule_312_Amendment.pdf	88168 35be61b43befc2c39940cd7ec7a34feccea04f27	no	14

Warnings:	
Information:	
Total Files Size (in bytes):	290774

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

New Applications Under 35 U.S.C. 111

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

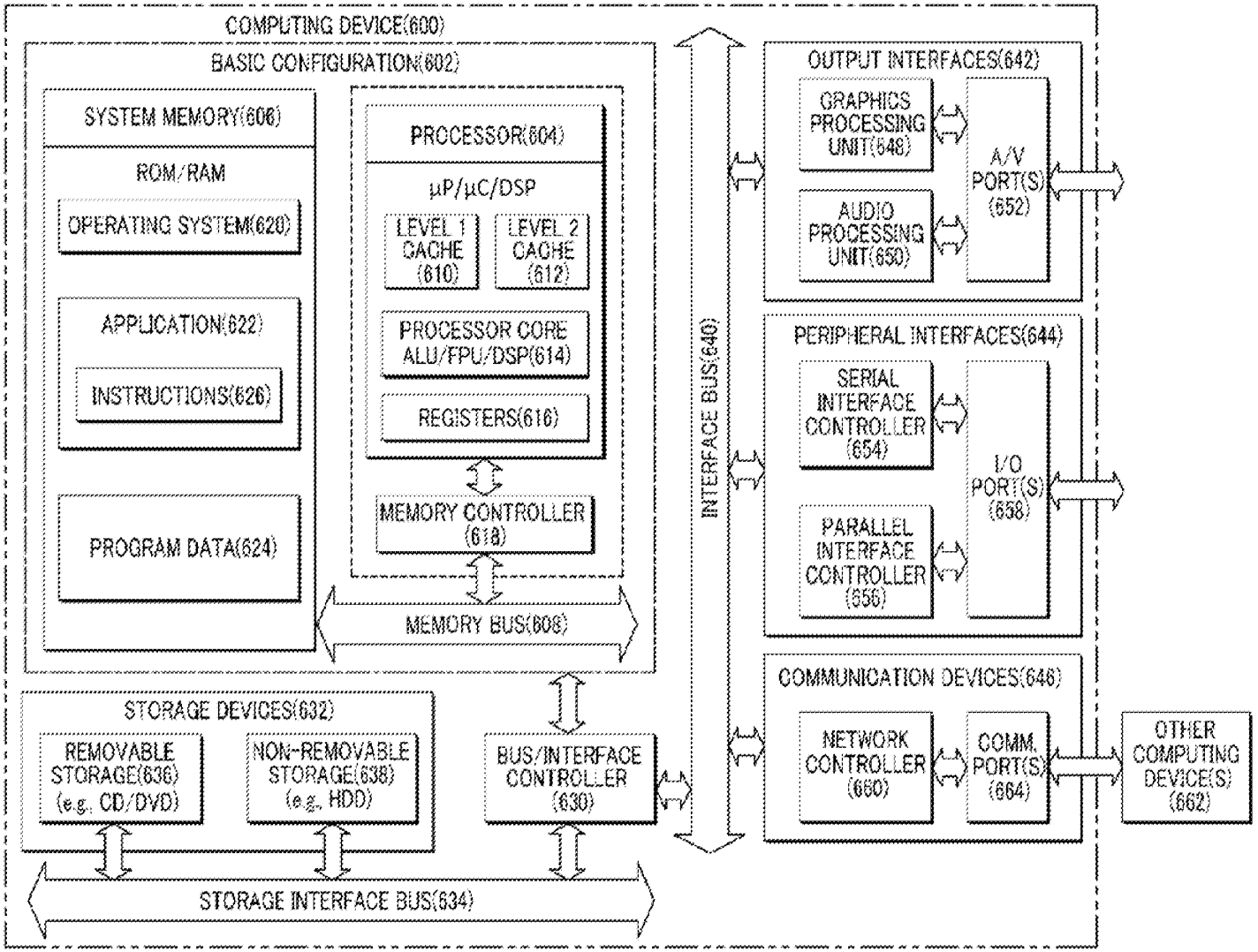
National Stage of an International Application under 35 U.S.C. 371

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

New International Application Filed with the USPTO as a Receiving Office

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

FIG. 6


COMPUTING DEVICE(600)
BASIC CONFIGURATION(602)
SYSTEM MEMORY(606)
ROM/RAM
OPERATING SYSTEM(620)
APPLICATION(622)
INSTRUCTIONS(626)
PROGRAM DATA(624)
PROCESSOR(604)
μP/μC/DSP
LEVEL 1 CACHE (610)
LEVEL 2 CACHE (612)
PROCESSOR CORE ALU/FPU/DSP(614)
REGISTERS(616)
MEMORY CONTROLLER (618)
MEMORY BUS(608)
INTERFACE BUS(640)
OUTPUT INTERFACES(642)
GRAPHICS PROCESSING UNIT(648)
AUDIO PROCESSING UNIT(650)
A/V PORT(S) (652)
PERIPHERAL INTERFACES(644)
SERIAL INTERFACE CONTROLLER (654)
PARALLEL INTERFACE CONTROLLER (656)
I/O PORT(S) (658)
COMMUNICATION DEVICES(646)
NETWORK CONTROLLER (660)
COMM. PORT(S) (664)
OTHER COMPUTING DEVICE(S) (662)
STORAGE DEVICES(632)
REMOVABLE STORAGE(636) (e.g. CD/DVD)
NON-REMOVABLE STORAGE(638) (e.g. HDD)
BUS/INTERFACE CONTROLLER (630)
STORAGE INTERFACE BUS(634)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No..... 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
Inventorship ..... Hyoung-Gon LEE
Group Art Unit..... 2414
Examiner ..... Clemence S. Han
Attorney Docket No. 2582.737BS
Title: .....SCHEMES FOR CONNECTING TO WIRELESS NETWORK

OK TO ENTER: /C.H./

AMENDMENT UNDER 37 C.F.R. § 1.312

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Madam:

Subsequent to the Notice of Allowance dated February 3, 2015, in connection with the above-identified application, the following amendments and remarks are respectfully submitted. An explanation regarding the propriety of the Amendment is included within the Remarks section. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

Amendments to the Drawings appear on page 3.

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A **Listing of the Claims** begins on page 7.

An **Amendment to the Abstract** appears on page 13.

Remarks begin on page 14.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 04/14/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
04/14/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/885,754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

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

1. ☒ The amendment filed on *01 April 2015* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/EDAN ORGAD/ Supervisory Patent Examiner, Art Unit 2414	/C. H./ Primary Examiner, Art Unit 2414

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 04/27/2015
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
04/27/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BRUNDIDGE & STANGER. P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

In re Application Of	:	
Lee, Hyoung-Gon	:	WITHDRAWN FROM ISSUE
Application No: 13/885,754	:	FEE NOT PAID
Filed: May 16, 2013	:	

Title: **SCHEMES FOR CONNECTING TO WIRELESS NETWORK**

The purpose of this communication is to inform you that the above identified application is being withdrawn from issue.

The application is being withdrawn to permit reopening of prosecution for consideration of newly discovered prior art.

Patent and Trademark Office records reveal that the issue fee has not been paid. If the issue fee has been submitted, the applicant may request a refund, or may request that the fee be credited to a deposit account. However, applicant may wait until the application is either again found allowable or held abandoned. If the application is allowed, upon receipt of a new Notice of Allowance and Issue Fee Due, applicant may request that the previously submitted issue fee be applied toward payment of the issue fee in the amount identified on the new Notice of Allowance and Issue Fee Due. If the application is abandoned, applicant may request either a refund or a credit to a specified Deposit Account.

Telephone inquiries are directed to Supervisory Patent Examiner Edan Orgad at 571-272-7884.

The application is being forwarded to the examiner for action.

Timothy P. Callahan
Director, Technology Center 2400

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 08/11/2015
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
08/11/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *04/01/2015*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-24* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-12 and 14-24* is/are rejected.

8)☒ Claim(s) *6 and 13* is/are objected to.

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. Prosecution on the merits of this application is reopened on claims 1-5, 7-12 and 14-24 considered unpatentable for the reasons indicated below.

Claim Rejections - 35 USC § 102

3. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

4. The following is a quotation of the appropriate paragraphs of pre-AIA 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1-3, 5, 7, 8 and 20-24 are rejected under pre-AIA 35 U.S.C. 102(a) as being anticipated by Jalfon et al. (US Pub. 2012/0076072).

Regarding claim 1 and 20, Jalfon teaches a method performed under control of an end device, comprising: transmitting, to an access point, a probe request frame including a fake device identifier for the end device (step 410 in Figure 4); receiving, from the access point, a probe response frame including information regarding the access point (step 415 in Figure 4); determining whether the access point is an

authenticated access point based at least in part on the information regarding the access point (step 420 in Figure 4); and transmitting, to the access point, a connection request including an authentic device identifier for the end device (step 425 in Figure 4).

Regarding claim 2 and 21, Jalfon teaches receiving, from the access point, an approval of the connection request (step 425 in Figure 4); and connecting to a wireless local area network 140 provided by the access point 130.

Regarding claim 3 and 24, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

Regarding claim 5 and 22, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 7, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 8 and 23, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

Claim Rejections - 35 USC § 103

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

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

7. Claims 4, 11, 12 and 14-19 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Mukherjee et al. (US Pub. 2007/0097904).

Regarding claim 4, Jalfon teaches the limitations cited in claim 2 as shown above. Jalfon, however, does not teach the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device. Mukherjee teaches the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device [0032]. It would have been obvious to one skilled in the art to modify Jalfon to have the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device as taught by Mukherjee in order to avoid impersonating access point [0032].

Regarding claim 11, Jalfon teaches an end device, comprising: a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier (step 410 in Figure 4); a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point (step 415 in Figure 4); a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list (step 420 in Figure 4); and a connecting unit configured to connect to a wireless local area network 140 provided by the access point 130, wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device

identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request (step 425 in Figure 4). Jalfon, however, does not teach a memory configured to store an authenticated access point list including information regarding at least one authenticated access point. Mukherjee teaches a memory 66 configured to store an authenticated access point list 62 including information regarding at least one authenticated access point. It would have been obvious to one skilled in the art to modify Jalfon to have a memory configured to store an authenticated access point list including information regarding at least one authenticated access point as taught by Mukherjee in order to avoid impersonating access point [0032].

Regarding claim 12, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 14, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 15, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

Regarding claim 16, Mukherjee teaches the determination unit is further configured to determine whether the information regarding the access point is included in the authenticated access point list [0032].

Regarding claim 17, Mukherjee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated

access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0032].

Regarding claim 18, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

Regarding claim 19, Mukherjee teaches the authenticated access point includes at least one of an access point controlled by a mobile operating server or an access point previously connected with the end device [0032].

8. Claims 9 and 10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Lee et al. (US Pub. 2006/0150250).

Regarding claim 9, Jalfon teaches the limitations cited in claim 1 as shown above. Jalfon, however, does not teach receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list. Lee teaches receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list ("authorized access point list … received from the wireless security management server 310" in [0070]). It would have been obvious to one skilled in the art to modify Jalfon to receive, from a mobile operating server, an authenticated access point list including information regarding at least one

authenticated access point, wherein the determining is further based at least in part on the authenticated access point list as taught by Lee in order to avoid attack from rogue access point [0067]-[0070].

Regarding claim 10, Lee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0102].

Allowable Subject Matter

9. Claims 6 and 13 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

Notice of References Cited	Application/Control No. 13/885,754	Applicant(s)/Patent Under Reexamination LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2012/0076072	03-2012	JALFON et al.	370/328
*	B	US-2007/0097904	05-2007	Mukherjee et al.	370/328
*	C	US-2006/0150250	07-2006	Lee et al.	726/023
*	D	US-2012/0064912	03-2012	OH, Min-Taek	455/456.1
*	E	US-2005/0059416	03-2005	Ono, Yoshihiro	455/457
*	F	US-2013/0301617	11-2013	Kuhn et al.	370/331
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1196	(ap "access point") adj list	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
L2	434	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
L3	333	2 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
L4	173	2 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
L5	376	3 4	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
L6	33	(ap "access point") adj list with (approved allowed)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
L8	11	5 and 6	US-PGPUB; USPAT	OR	ON	2015/08/07 18:58
L9	56	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
L10	37	5 and 9	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
L11	31	(mac media ssid) and 10	US-PGPUB; USPAT	OR	ON	2015/08/07 19:49
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22

S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device identifier" "device id")	US-PGPUB; USPAT	OR	ON	2015/01/19 19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S23	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S24	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S25	10351	h04w12/06.cpc.	US-PGPUB;	OR	ON	2015/02/01 18:58

			USPAT			
S26	8623	h04w84/12.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S27	7411	h04w88/08.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S28	31521	S23 S24 S25 S26 S27	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S29	581	"probe request frame" and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S30	1	"probe request frame" with fake and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S31	1	("20120076072").PN.	US-PGPUB; USPAT	OR	OFF	2015/04/10 10:19
S33	5015	(ap "access point") near3 list	US-PGPUB; USPAT	OR	ON	2015/04/12 15:25
S34	2159	fake with (address mac id identifier)	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S35	19	S33 and S34	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S36	17	S35 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S37	11	S35 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S38	17	S36 S37	US-PGPUB; USPAT	OR	ON	2015/04/12 15:50

8/7/2015 8:17:07 PM
C:\Users\chan\Documents\EAST\Workspaces\13885754.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch
see Search History printout	8/7/2015	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	see Interference Search printout	2/1/2015	ch

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 10/22/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
10/22/2015	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/885,754	LEE, HYOUNG-GON	
	Examiner	Art Unit	
	CLEMENCE HAN	2414	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CLEMENCE HAN*. (3)_____.

(2) *Daniel Stanger*. (4)_____.

Date of Interview: *20 October 2015*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☒112 ☒102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1,4,11 and 20*.

Identification of prior art discussed: *Jalfon et al (US Pub. 2012/0076072), Mukherjee et al. (US Pub. 2007/0097904)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Applicant's representative argued that Mukherjee does not show controller 68 controlled by auth. server 90 or access point 75 previously connected to end device. Examiner said Mukherjee might not teach an access point controlled by a mobile operating server, however teaches an access point previously connected with the end device [0032]. Then the discussion moved onto how to include the limitations from the objected claim 6 into the rejected independent claim 1. Proposed amendment from the applicant's represent including "receiving a fake device identifier from a mobile operating server; transmitting, to an access point, a probe request frame including the fake device identifier for the end device;" were considered and agreed to put the claim into allowable condition by the examiner. Similar amendments on the other independent claims 11 and 20 are expected with clearing of any 112 issues caused by these amendments. .

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/CLEMENCE HAN/ Primary Examiner, Art Unit 2414	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
First Named Inventor ..... Hyoung-Gon LEE
Art Unit 2414
Examiner ..... Clemence S. Han
Attorney Docket No. 2582.737BS
Title: ..... SCHEMES FOR CONNECTING TO WIRELESS NETWORK

RESPONSE TO NON-FINAL OFFICE ACTION OF AUGUST 11, 2015

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Sir:

In response to the Non-final Office Action dated August 11, 2015, for which the three-month shortened statutory period for response is set to expire on November 11, 2015, the following amendments and remarks are respectfully submitted. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

A **Listing of the Claims** begins on page 3.

Remarks begin on page 9.

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims pending:

- At time of the Action: **Claims 1-24**
- After this Reply: **Claims 1-5, 7-12, and 14-25**

Currently Canceled or Withdrawn Claims: **Claims 6 and 13**

Currently Amended Claims: **Claims 1, 4, 11, and 19-20**

New Claims: **Claim 25**

1. (**Currently Amended**) A method performed under control of an end device, comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame including ~~a fake~~ the fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier for the end device.

2. (**Original**) The method of Claim 1**,** further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (**Original**) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. (**Currently Amended**) The method of Claim 2, wherein the determining includes determining that the access point is an authenticated access point ~~includes~~ based at least in part on at least one ~~of an~~ of the access point being controlled by a mobile operating server ~~or an~~ or the access point being previously connected with the end device.

5. (**Original**) The method of Claim 1**,** further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. (**Canceled**)

7. (**Original**) The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. (**Original**) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (**Original**) The method of Claim 1, further comprising:

receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. (**Original**) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (**Currently Amended**) An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and

wherein the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. (**Original**) The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. (**Canceled**)

14. (**Original**) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (**Original**) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (**Previously Presented**) The end device of Claim 11, wherein the determination unit is further configured to determine whether the information regarding the access point is included in the authenticated access point list.

17. (**Original**) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (**Original**) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (**Currently Amended**) The end device of Claim 11, wherein the determination unit is further configured to determine that the access point is an authenticated access point ~~includes~~ based at least in part on at least one ~~of an~~ of the access point being controlled by a mobile operating server ~~or an~~ or the access point being previously connected with the end device.

20. (**Currently Amended**) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame including ~~a fake~~ the fake device identifier ~~of~~ for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining whether the access point is an authenticated access point based at least in part on the information regarding the access point; and

transmitting, to the access point, a connection request including an authentic device identifier of the end device.

21. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and connecting to a wireless local area network provided by the access point.

22. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

25. (**New**) The non-transitory computer-readable storage medium of Claim 20, wherein the determining includes determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device.

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1-5, 7-12, and 14-25 are now pending. **Claims 1-3, 5, 7, 8 and 20-24** were rejected under 35 U.S.C. § 102(a). **Claims 4, 11, 12 and 14-19** were rejected under 35 U.S.C. § 103(a)**. Claims 6 and 13** are objected to as being dependent upon a rejected base claim. **Claims 1, 4, 11, and 19-20** are currently amended and new **Claim 25** is submitted for consideration. Support for the amendments to independent **Claims 1, 11, and 20** can be found, for example, in **Claim 6 or 13**. Support for new **Claim 25** may also be found in **Claim 4 or Claim 19**. No new matter is added.

INTERVIEW

Applicant's representative thanks the Examiner for the courtesies extended during the telephone interview held on October 20, 2015. Agreement was reached during the interview that, considering the subject matter incorporated into independent **Claims 1 and 20** from dependent **Claim 6** and the subject matter incorporated into independent **Claim 11** from dependent **Claim 13** , **Claims 1, 11, and 20**, and claims dependent thereon, are in allowable condition.

ALLOWABLE SUBJECT MATTER

Claims 6 and 13 *are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.*

Applicant thanks the Examiner for the indication of allowable subject matter in **Claims 6 and 13**. The subject matter of these claims is added above to **Claims 1 and 11**, respectively. **Claim 20** has also been amended in a similar fashion and is allowable.

CLAIM REJECTION UNDER 35 U.S.C. § 102(a)

Claims 1-3, 5, 7, 8 and 20-24 *are rejected under pre-AIA 35 U.S.C. § 102(a) as allegedly being anticipated by Jalfon et al. (U.S. Publication No. 2012/0076072; hereafter "Jalfon").*

Applicant traverses the rejection, and respectfully requests that the rejection be reconsidered and withdrawn.

Without admitting to the propriety of the rejection, Applicant amends independent **Claims 1 and 20** to add the allowable subject matter of **Claim 6**. Thus, **Claims 1 and 20** are patentably distinguishable from Jalfon.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

The outstanding Office Action includes the following rejections under 35 U.S.C. § 103(a):

> ***a) Claims 4, 11, 12 and 14-19*** *are rejected as being unpatentable over Jalfon, in view of Mukherjee et al. (U.S. Publication No. 2007/0097904; hereafter "Mukherjee").*
>
> ***b) Claims 9 and 10*** *are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon in view of Lee et al. (US Pub. 2006/0150250; hereafter "Lee").*

Applicant traverses rejections a) - b), and respectfully requests that the rejections be reconsidered and withdrawn.

a) Claims 4, 11, 12 and 14-19 *are rejected as being unpatentable over Jalfon, in view of Mukherjee et al. (U.S. Publication No. 2007/0097904; hereafter "Mukherjee").*

Without admitting to the propriety of the rejection, Applicant amends independent **Claim 11** to add the allowable subject matter of **Claim 6**. Thus, Jalfon and Mukherjee, alone or in combination, fail to teach or suggest every element recited in **Claim 11.** Accordingly, a *prima facie* case of obviousness cannot be established by Jalfon in view of Mukherjee.

In accordance with the amendment, reconsideration and withdrawal of rejection a) are respectfully requested.

b) Claims 9 and 10 *are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon in view of Lee et al. (US Pub. 2006/0150250; hereafter "Lee").*

Claims 9-10 are dependent claims that inherit the patentability of the independent claim from which each is derived. For at least the foregoing reasons, then, Jalfon and Lee, alone or in combination, fail to teach or suggest every element recited in **Claims 9-10.** Accordingly, a *prima facie* case of obviousness cannot be established over Jalfon in view of Lee.

In accordance with the amendment, reconsideration and withdrawal of rejection b) are respectfully requested.

NEW CLAIM

New **Claim 25** is dependent from **Claim 20** which, as demonstrated above, is free of the art of record. Therefore, because **Claim 25** inherits the patentability of a patentable claim, **Claim 25** is patentable as well.

In addition, **Claim 25** recites that "the determining includes determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device." This feature is also recited in **Claims 4 and 19** (as amended). The rejection of **Claims 4 and 19** alleges that Mukherjee teaches a similar feature in paragraph [0032]. However, paragraph [0032], reproduced below, neither teaches nor suggests an authenticated access point that includes at least one of an access point ***controlled by a mobile operating server*** or an access point ***previously connected with the end device***:

> [0032] Similarly, each wireless node 60 includes an antenna 61, transceiver 64, a memory and a controller 68. When the wireless node 60 receives packets from the access point 70, the respective authentication tokens and origination addresses for the access point are stored in the memory 66 coupled to the transceiver 64. An antenna 61 is coupled to the transceiver 64. The respective authentication tokens

> and origination addresses are used to define the allowed access point list 62 that is also stored in the memory 66. The controller 68 causes the transceiver 64 not to associate with an access point 75 if both an authentication token and an address for that access point are not on the allowed access point list. This access point 75 is an attacker or impersonating access point.

Applicant acknowledges that Mukherjee discloses that "controller 68 causes the transceiver 64 not to associate with an access point 75 if both an authentication token and an address for that access point are not on the allowed access point list." However, controller 68 is included in wireless node 60 which, along with authentication server 90, is connected to a distribution network, Mukherjee never discloses that controller 68 is controlled by authentication server 90. Further, Mukherjee does not disclose that access point 75 is previously connected to the end device.

To clarify this feature, **Claim 25** recites, and **Claims 4 and 19** are amended to recite, that the access point is determined to be an authenticated access point "based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device." Neither Jalfon nor Mukherjee suggests this feature.

CONCLUSION

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and therefore early and forthright issuance of a Notice to that effect is earnestly solicited.

Respectfully submitted,

Brundidge & Stanger, PC

Dated: October 23, 2015

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

Electronic Acknowledgement Receipt

EFS ID:	23870200
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger
Filer Authorized By:	
Attorney Docket Number:	2582.737BS
Receipt Date:	23-OCT-2015
Filing Date:	16-MAY-2013
Time Stamp:	19:51:51
Application Type:	U.S. National Stage under 35 USC 371

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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	KR-839496-02-US-NAT_20151023_Second_OA_Response.pdf	120592 a4d37ea22c6f08787ca34268098d26d8b1ed2c3e	no	13

Warnings:	
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Total Files Size (in bytes):	120592

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/885,754	Filing Date 05/16/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **10/23/2015**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 24	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/NICOLLE L. SCRIVNER/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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NOTICE OF ALLOWANCE AND FEE(S) DUE

86636 7590 11/19/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 11/19/2015

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/19/2016

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
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Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

86636 7590 11/19/2015
BRUNDIDGE & STANGER, P.C.
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ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/19/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAN, CLEMENCE S	2414	370-338000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 11/19/2015

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
HAN, CLEMENCE S	

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 11/19/2015

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *10/23/2015*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-5, 7-12 and 14-25 now renumbered as 1-23 in order*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov .
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

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

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

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

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Allowable Subject Matter

2. Claims 1-5, 7-12 and 14-25 are allowed.

3. The following is an examiner's statement of reasons for allowance: The present invention is directed to a method for connecting to an authenticated access point.

4. Jalfon et al. (US Pub. 2012/0076072) teaches transmitting a probe request frame including the fake device identifier (Figure 4).

5. The prior arts in the record fail to teach or make obvious to a method comprising receiving the fake device identifier from the mobile operating server within a structure of the claim. These features are claimed in the independent claims 1, 11 and 20 and render them allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch
see Search History printout	8/7/2015	ch
see Search History printout	11/15/2015	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	see Interference Search printout	2/1/2015	ch
	see Interference Search printout	11/15/2015	ch

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	460	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L4	339	L3 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L5	184	L3 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L6	390	L4 L5	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L7	61	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L8	37	L6 and L7	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L9	31	(mac media ssid) and L8	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
L10	30	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2015/11/15 22:51
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25

S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device identifier" "device id")	US-PGPUB; USPAT	OR	ON	2015/01/19 19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S23	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S24	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S25	10351	h04w12/06.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S26	8623	h04w84/12.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S27	7411	h04w88/08.cpc.	US-PGPUB;	OR	ON	2015/02/01 18:58

			USPAT			
S28	31521	S23 S24 S25 S26 S27	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S29	581	"probe request frame" and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S30	1	"probe request frame" with fake and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S31	1	("20120076072").PN.	US-PGPUB; USPAT	OR	OFF	2015/04/10 10:19
S33	5015	(ap "access point") near3 list	US-PGPUB; USPAT	OR	ON	2015/04/12 15:25
S34	2159	fake with (address mac id identifier)	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S35	19	S33 and S34	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S36	17	S35 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S37	11	S35 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S38	17	S36 S37	US-PGPUB; USPAT	OR	ON	2015/04/12 15:50
S39	1196	(ap "access point") adj list	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S40	434	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S41	333	S40 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S42	173	S40 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S43	376	S41 S42	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S44	33	(ap "access point") adj list with (approved allowed)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S46	11	S43 and S44	US-PGPUB; USPAT	OR	ON	2015/08/07 18:58
S47	56	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S48	37	S43 and S47	US-PGPUB;	OR	ON	2015/08/07 19:11

			USPAT			
S49	31	(mac media ssid) and S48	US-PGPUB; USPAT	OR	ON	2015/08/07 19:49

11/ 15/ 2015 10:51:44 PM
C:\ Users\ chan\ Documents\ EAST\ Workspaces\ 13885754.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

CPC								
Symbol							**Type**	**Version**
H04W		12	/	08			F	2013-01-01
H04W		8	/	26			I	2013-01-01
H04W		48	/	20			I	2013-01-01
H04W		12	/	06			I	2013-01-01
H04W		84	/	12			A	2013-01-01
H04W		88	/	08			A	2013-01-01
H04L		63	/	10			I	2013-01-01
			/					
			/					
			/					
			/					
			/					
			/					
			/					
			/					

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
			/					
			/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	11/15/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
		H	0	4	W	4 / 00 (2009.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	23	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	11/15/2015	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 23	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414 (Primary Examiner)	11/15/2015 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	55	(fake with (address mac id identifier)).clm.	USPAT	OR	ON	2015/11/15 22:38
L2	89	("probe request frame").clm.	USPAT; * No UPAD	OR	ON	2015/11/15 22:38
S32	77	("probe request frame").clm.	USPAT; * No UPAD	OR	ON	2015/04/10 11:10

11/ 15/ 2015 10:52:06 PM
C:\ Users\ chan\ Documents\ EAST\ Workspaces\ 13885754.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No..... 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
Inventorship ..... Hyoung-Gon Lee
Group Art Unit..... 2414
Examiner ..... HAN, CLEMENCE S
Attorney Docket No. 2582.737BS
Title: .....SCHEMES FOR CONNECTING TO WIRELESS NETWORK

AMENDMENT UNDER 37 C.F.R. § 1.312

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Sir:

Subsequent to the Notice of Allowance dated November 19, 2015, in connection with the above-identified application, the following amendments and remarks are respectfully submitted. An explanation regarding the propriety of the Amendment is included within the Remarks section. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

An **Amendment to the Specification** begins on page 3.

Amendments to the Drawings begin on page 5.

A substitute **Abstract** is set forth on page 6.

Remarks begin on page 7.

AMENDMENT TO THE SPECIFICATION

The following will replace all prior versions of the listed paragraphs in the application. The amendment to the specification does not introduce any new matter.

Please amend paragraphs [0011], [0020], [0048], [0049], and [0052] below as shown:

[0011] FIG. 5 illustrates a computer program ~~products~~ product that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein; and

[0020] As illustrated in FIG. 1, network communications environment 100 may include a mobile operating server 110, an access point 120 and an end device 130. Mobile operating server 110 may control access point 120. In ~~FIG 1~~ FIG. 1, although only one access point (i.e., access point 120) is located around end device 130, so that end device 130 is located in a network area 140 provided by access point 120, there could be two or more access points around end device 130.

[0048] FIG. 5 illustrates a computer program ~~products~~ product 500 that may be utilized to provide a scheme for connecting to a wireless local area network, arranged in accordance with at least some embodiments described herein. ~~Program~~ Computer program product 500 may include a signal bearing medium 502. Signal bearing medium 502 may include one or more instructions 504 that, when executed by, for example, a processor, may provide the functionality described above with respect to FIGS. 1-4. By way of example, instructions 504 may include: one or more instructions for transmitting a probe request frame including a fake device identifier (for example, a fake MAC address) of the end device to an access point, one or more instructions for receiving a probe response frame including information regarding

the access point from the access point, one or more instructions for determining whether the access point is an authenticated access point based at least in part regarding the information regarding the access point, and one or more instructions for transmitting a connection request including an authentic device identifier of the end device to the access point. Thus, for example, referring to FIG. 4, end device 130 may undertake one or more of the blocks shown in FIG. 3 in response to instructions 504.

[0049] In some implementations, signal bearing medium 502 may encompass a computer-readable medium 506, such as, but not limited to, a hard disk drive, a CD, a DVD, a digital tape, memory, etc. In some implementations, signal bearing medium 502 may encompass a recordable medium 508, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 502 may encompass a communications medium 510, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired communications link, a wireless communication link, etc.). Thus, for example, computer program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 502, where the signal bearing medium 502 is conveyed by a wireless communications medium 510 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

[0052] Depending on the desired configuration, system memory 606 may be of any type including but not limited to volatile memory (such as RAM), non- volatile memory (such as ROM, flash memory, etc.) or any combination thereof. System memory 606 may include an operating system 620, one or more applications 622 (including instructions 626), and program data 624.

AMENDMENTS TO THE DRAWINGS

A replacement sheet is hereby submitted. The replacement sheet does not introduce any new matter.

In the replacement sheet of drawings, FIG. 6 is amended as follows:

- In Fig. 6, Sheet 6 of 6, delete "OUTPUT INTERFACES (642)" and insert - - OUTPUT DEVICES (642) - - therefor.

Attached: Replacement Sheet of Drawings

SUBSTITUTE ABSTRACT

Please replace the Abstract with the following substitute abstract:

Technologies are generally described for connecting to a wireless local area network. In some examples, a method performed under control of an end device may include transmitting a probe request frame including a fake device identifier for the end device to an access point, receiving a probe response frame including information regarding the access point from the access point, determining whether the access point is an authenticated access point based at least in part on the information regarding the access point, and transmitting a connection request including an authentic device identifier for the end device to the access point.

REMARKS

The specification is amended at paragraphs [0011], [0020], [0048], [0049], and [0052] to correct for minor typographical informalities identified during review of the application. By entry of the amendments, the specification is made consistent with the other papers that are of record in the file wrapper of the present application. Entry of the amendments to the specification is respectfully requested. No additional search or examination is required and no new matter is added. Therefore, favorable consideration and entry of the amended specification and claims are respectfully requested.

FIG. 6 is amended to correct for a minor typographical discrepancy identified during review of the application. Entry of the amendments to FIG. 6 is respectfully requested.

The Abstract is replaced with the Abstract as originally filed. Through an inadvertent clerical error, an incorrect Abstract was submitted with the Rule 312 Amendment filed on April 1, 2015.

The Examiner's statement of reasons for allowance of the above-referenced patent application is acknowledged and it is agreed that the claimed subject matter is patentable. However, no position is taken regarding the reasons for allowance presented by the Examiner other than the positions that may have previously been taken during prosecution. Therefore, the Examiner's reasons for allowance should not be attributed as being an indication of the basis for the belief that the claims are patentable. Furthermore, it is respectfully asserted that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and no waiver of rights are made to such arguments by not further addressing such reasons herein.

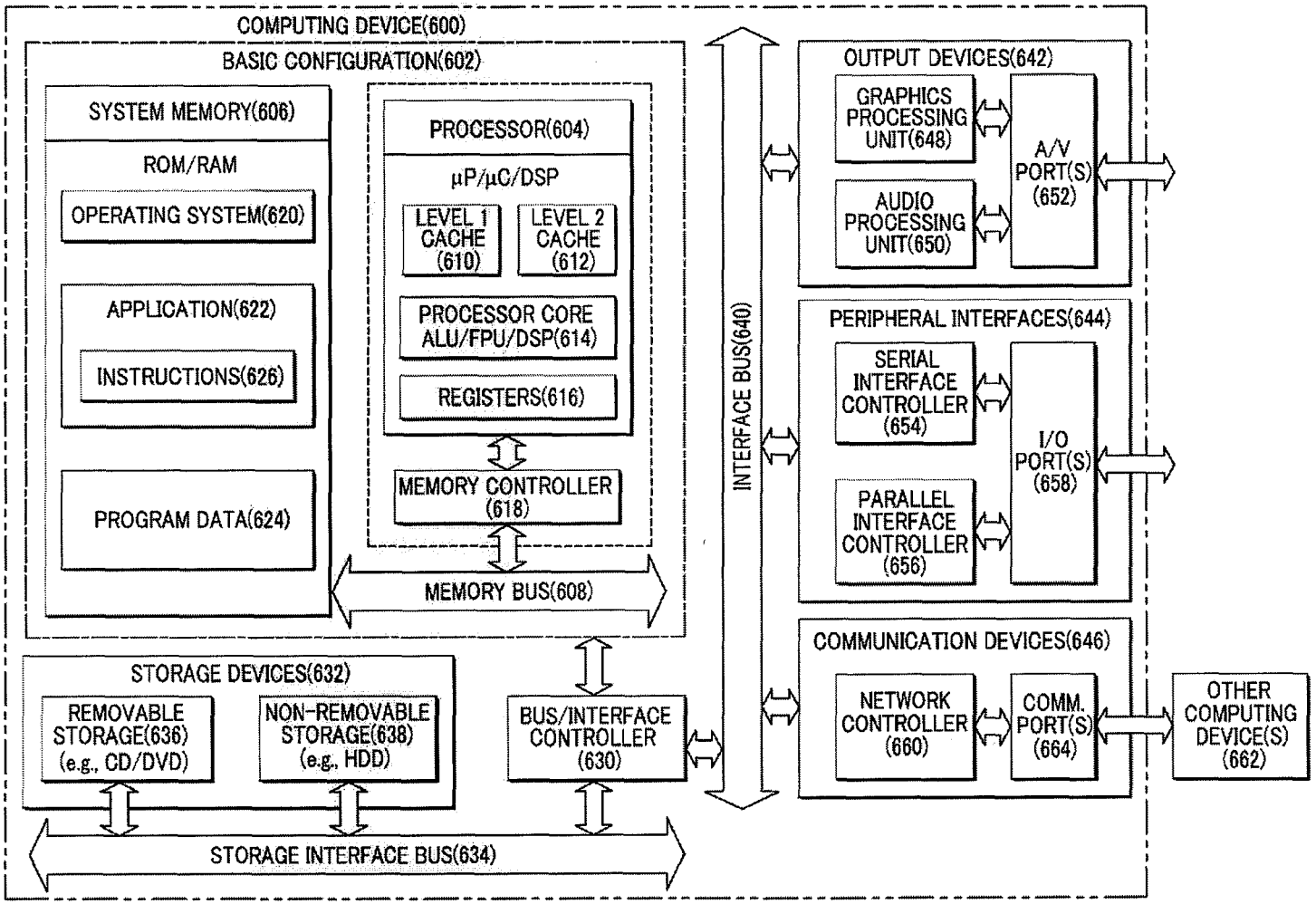
Respectfully submitted,

Brundidge & Stanger, PC

Dated: December 28, 2015

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

FIG. 6


COMPUTING DEVICE(600)
BASIC CONFIGURATION(602)
SYSTEM MEMORY(606)
ROM/RAM
OPERATING SYSTEM(620)
APPLICATION(622)
INSTRUCTIONS(626)
PROGRAM DATA(624)
PROCESSOR(604)
μP/μC/DSP
LEVEL 1 CACHE (610)
LEVEL 2 CACHE (612)
PROCESSOR CORE ALU/FPU/DSP(614)
REGISTERS(616)
MEMORY CONTROLLER (618)
MEMORY BUS(608)
INTERFACE BUS(640)
OUTPUT DEVICES(642)
GRAPHICS PROCESSING UNIT(648)
AUDIO PROCESSING UNIT(650)
A/V PORT(S) (652)
PERIPHERAL INTERFACES(644)
SERIAL INTERFACE CONTROLLER (654)
PARALLEL INTERFACE CONTROLLER (656)
I/O PORT(S) (658)
COMMUNICATION DEVICES(646)
NETWORK CONTROLLER (660)
COMM. PORT(S) (664)
OTHER COMPUTING DEVICE(S) (662)
STORAGE DEVICES(632)
REMOVABLE STORAGE(636) (e.g., CD/DVD)
NON-REMOVABLE STORAGE(638) (e.g., HDD)
BUS/INTERFACE CONTROLLER (630)
STORAGE INTERFACE BUS(634)

Electronic Acknowledgement Receipt

EFS ID:	24456334
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger/Beatriz Sanchez
Filer Authorized By:	Daniel John Stanger
Attorney Docket Number:	2582.737BS
Receipt Date:	28-DEC-2015
Filing Date:	16-MAY-2013
Time Stamp:	13:30:49
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment after Notice of Allowance (Rule 312)	KR-839496-02-US-NAT_20151228_Rule_312Amendment.pdf	65709 8cb559e2cbc79ef3008420bf433fb3e73b96940c	no	7

Warnings:	
Information:	

2	Amendment after Notice of Allowance (Rule 312)	KR-839496-02-US-NAT_20151228_Replacement_Sheet.pdf	64340 9de233cb5ba7220f7b88045059e438a898189b19	no	1

Warnings:	
Information:	
Total Files Size (in bytes):	130049

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 01/04/2016

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
01/04/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/885,754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

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

1. ☒ The amendment filed on *12/28/2015* under 37 CFR 1.312 has been considered, and has been:

   a) ☒ entered.

   b) ☐ entered as directed to matters of form not affecting the scope of the invention.

   c) ☐ disapproved because the amendment was filed after the payment of the issue fee.
   Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

   d) ☐ disapproved. See explanation below.

   e) ☐ entered in part. See explanation below.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No..... 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
Inventorship ..... Hyoung-Gon Lee
Group Art Unit..... 2414
Examiner ..... HAN, CLEMENCE S
Attorney Docket No. 2582.737BS
Title: .....SCHEMES FOR CONNECTING TO WIRELESS NETWORK

AMENDMENT UNDER 37 C.F.R. § 1.312

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
OK TO ENTER: /C.H./ Alexandria, VA 22314

Sir:

Subsequent to the Notice of Allowance dated November 19, 2015, in connection with the above-identified application, the following amendments and remarks are respectfully submitted. An explanation regarding the propriety of the Amendment is included within the Remarks section. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

An **Amendment to the Specification** begins on page 3.

Amendments to the Drawings begin on page 5.

A substitute **Abstract** is set forth on page 6.

Remarks begin on page 7.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

86636 7590 11/19/2015
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$0	$960	02/19/2016

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAN, CLEMENCE S	2414	370-338000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Brundidge & Stanger, P.C.
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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

(A) NAME OF ASSIGNEE: Empire Technology Development LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Wilmington, Delaware (US)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ■ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ■ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ■ Payment by credit card. Form PTO-2038 is attached.
- ■ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-4888 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29
  NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27
  NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status.
  NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Daniel J. Stanger/ Date January 14, 2016

Typed or printed name Daniel J. Stanger Registration No. 32,846

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13885754
Filing Date:	16-May-2013
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Filer:	Daniel John Stanger/Beatriz Sanchez
Attorney Docket Number:	2582.737BS

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	24618252
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger/Beatriz Sanchez
Filer Authorized By:	Daniel John Stanger
Attorney Docket Number:	2582.737BS
Receipt Date:	14-JAN-2016
Filing Date:	16-MAY-2013
Time Stamp:	15:51:14
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$960
RAM confirmation Number	2413
Deposit Account	504888
Authorized User	BRUNDIDGE, CARL I.

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 CFR 1.492 (National application filing, search, and examination fees)

Charge any Additional Fees required under 37 CFR 1.17 (Patent application and reexamination processing fees)

Charge any Additional Fees required under 37 CFR 1.19 (Document supply fees)

Charge any Additional Fees required under 37 CFR 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 CFR 1.21 (Miscellaneous fees and charges)

Charge any Additional Fees required under 37 CFR 1.492(a) (basic national fee only)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	KR-839496-02-US-NAT_20160114_Issue_Fee_Payment.pdf	101754 13a2ddded25628d7bc27bad2ac35849589a93ab2	no	1
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30813 348a08d68675a598cd9e09451bc56922b77853c0	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	132567		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 04/19/2016
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
04/19/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *10/23/2015*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-5,7-12 and 14-25* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-5,7-12 and 14-25* is/are rejected.

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

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

1. The present application is being examined under the pre-AIA first to invent provisions.

2. Prosecution on the merits of this application is reopened on claims 1-5, 7-12 and 14-25 considered unpatentable for the reasons indicated below.

Claim Objections

3. Claim 4 is objected to because of the following informalities: "a mobile operating server" in line 3 should be replaced with "the mobile operating server", see claim 1 line 2. Appropriate correction is required.

4. Claim 9 is objected to because of the following informalities: "a mobile operating server" in line 2 should be replaced with "the mobile operating server", see claim 1 line 2. Appropriate correction is required.

5. Claim 19 is objected to because of the following informalities: "a mobile operating server" in line 3 should be replaced with "the mobile operating server", see claim 11 line 13. Appropriate correction is required.

6. Claim 25 is objected to because of the following informalities: "a mobile operating server" in line 3 should be replaced with "the mobile operating server", see claim 20 line 4. Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new

ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

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

9. Claims 1-3, 5, 7, 8 and 20-24 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. (US Pub. 2012/0076072).

Regarding claim 1 and 20, Jalfon teaches a method performed under control of an end device, comprising: transmitting, to an access point, a probe request frame including a fake device identifier for the end device (step 410 in Figure 4); receiving, from the access point, a probe response frame including information regarding the access point (step 415 in Figure 4); determining whether the access point is an authenticated access point based at least in part on the information regarding the access point (step 420 in Figure 4); and transmitting, to the access point, a connection request including an authentic device identifier for the end device (step 425 in Figure 4). Jalfon does not specifically disclose a “mobile operating server” provides the fake device identifier (MAC address) to the end device. Jalfon teaches "In some embodiment, a pool of addresses may be provided to the wireless communication device A ... In other embodiment ... device A may ... generate such addresses" [0034]. Therefore, using a “mobile operating server” to provide the fake device identifier to the

end device would have been an obvious variation of Jalfon teaching. Using a "mobile operating server" with Jalfon to provide the fake device identification would have produced expected results from performing the function in a server, such as centralized control of the fake ID generation/list, ensuring plural end devices do not use the same fake ID, etc.

Regarding claim 2 and 21, Jalfon teaches receiving, from the access point, an approval of the connection request (step 425 in Figure 4); and connecting to a wireless local area network 140 provided by the access point 130.

Regarding claim 3 and 24, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

Regarding claim 5 and 22, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 7, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 8 and 23, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

10. Claims 4, 11, 12, 14-19 and 25 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Mukherjee et al. (US Pub. 2007/0097904).

Regarding claim 4, Jalfon teaches the limitations cited in claim 2 as shown above. Jalfon, however, does not teach determining that the access point is an

authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device. Mukherjee teaches determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device [0032]. It would have been obvious to one skilled in the art to modify Jalfon to determine that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device as taught by Mukherjee in order to avoid impersonating access point [0032].

Regarding claim 11, Jalfon teaches an end device, comprising: a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier (step 410 in Figure 4); a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point (step 415 in Figure 4); a determination unit configured to determine whether the access point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list (step 420 in Figure 4); and a connecting unit configured to connect to a wireless local area network 140 provided by the access point 130, wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request (step 425 in Figure 4). Jalfon does not

specifically disclose a “mobile operating server” provides the fake device identifier (MAC address) to the end device. Jalfon teaches "In some embodiment, a pool of addresses may be provided to the wireless communication device A ... In other embodiment ... device A may ... generate such addresses" [0034]. Therefore, using a “mobile operating server” to provide the fake device identifier to the end device would have been an obvious variation of Jalfon teaching. Using a “mobile operating server” with Jalfon to provide the fake device identification would have produced expected results from performing the function in a server, such as centralized control of the fake ID generation/list, ensuring plural end devices do not use the same fake ID, etc. Jalfon, however, does not teach a memory configured to store an authenticated access point list including information regarding at least one authenticated access point. Mukherjee teaches a memory 66 configured to store an authenticated access point list 62 including information regarding at least one authenticated access point. It would have been obvious to one skilled in the art to modify Jalfon to have a memory configured to store an authenticated access point list including information regarding at least one authenticated access point as taught by Mukherjee in order to avoid impersonating access point [0032].

Regarding claim 12, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 14, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 15, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

Regarding claim 16, Mukherjee teaches the determination unit is further configured to determine whether the information regarding the access point is included in the authenticated access point list [0032].

Regarding claim 17, Mukherjee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0032].

Regarding claim 18, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

Regarding claim 19, Mukherjee teaches determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device [0032].

Regarding claim 25, Jalfon teaches the limitations cited in claim 20 as shown above. Jalfon, however, does not teach determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously

connected with the end device. Mukherjee teaches determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device [0032]. It would have been obvious to one skilled in the art to modify Jalfon to determine that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously connected with the end device as taught by Mukherjee in order to avoid impersonating access point [0032].

11. Claims 9 and 10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Lee et al. (US Pub. 2006/0150250).

Regarding claim 9, Jalfon teaches the limitations cited in claim 1 as shown above. Jalfon, however, does not teach receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list. Lee teaches receiving, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list ("authorized access point list … received from the wireless security management server 310" in [0070]). It would have been obvious to one skilled in the art to modify Jalfon to receive, from a mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on

the authenticated access point list as taught by Lee in order to avoid attack from rogue access point [0067]-[0070].

Regarding claim 10, Lee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0102].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

Notice of References Cited	Application/Control No. 13/885,754	Applicant(s)/Patent Under Reexamination LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2006/0150250 A1	07-2006	Lee; Sok Joon	H04L63/1416	726/23
*	B	US-2007/0097904 A1	05-2007	Mukherjee; Rajat Pritam	H04W12/06	370/328
*	C	US-2012/0076072 A1	03-2012	JALFON; Marc	H04W12/02	370/328
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	33	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/04/16 11:32
L2	3	(("20070097904") or ("20120076072") or ("20060150250")).PN.	US-PGPUB; USPAT	OR	OFF	2016/04/16 11:33
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30

S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device identifier" "device id")	US-PGPUB; USPAT	OR	ON	2015/01/19 19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S23	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S24	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S25	10351	h04w12/06.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S26	8623	h04w84/12.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S27	7411	h04w88/08.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S28	31521	S23 S24 S25 S26 S27	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S29	581	"probe request frame" and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S30	1	"probe request frame" with fake and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S31	1	("20120076072").PN.	US-PGPUB; USPAT	OR	OFF	2015/04/10 10:19
S33	5015	(ap "access point") near3 list	US-PGPUB; USPAT	OR	ON	2015/04/12 15:25
S34	2159	fake with (address mac id identifier)	US-PGPUB;	OR	ON	2015/04/12 15:27

			USPAT			
S35	19	S33 and S34	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S36	17	S35 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S37	11	S35 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S38	17	S36 S37	US-PGPUB; USPAT	OR	ON	2015/04/12 15:50
S39	1196	(ap "access point") adj list	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S40	434	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S41	333	S40 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S42	173	S40 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S43	376	S41 S42	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S44	33	(ap "access point") adj list with (approved allowed)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S46	11	S43 and S44	US-PGPUB; USPAT	OR	ON	2015/08/07 18:58
S47	56	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S48	37	S43 and S47	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S49	31	(mac media ssid) and S48	US-PGPUB; USPAT	OR	ON	2015/08/07 19:49
S50	460	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S51	339	S50 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S52	184	S50 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S53	390	S51 S52	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S54	61	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB;	OR	ON	2015/11/15 22:50

			USPAT			
S55	37	S53 and S54	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S56	31	(mac media ssid) and S55	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S57	30	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2015/11/15 22:51

4/ 16/ 2016 11:34:12 AM
C:\ Users\ chan\ Documents\ EAST\ Workspaces\ 13885754.wsp

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch
see Search History printout	8/7/2015	ch
see Search History printout	11/15/2015	ch
see Search History printout	4/16/2016	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
	see Interference Search printout	2/1/2015	ch
	see Interference Search printout	11/15/2015	ch

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 07/07/2016
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
07/07/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Applicant-Initiated Interview Summary	Application No.	Applicant(s)	
	13/885,754	LEE, HYOUNG-GON	
	Examiner	Art Unit	
	CLEMENCE HAN	2414	

All participants (applicant, applicant's representative, PTO personnel):

(1) *CLEMENCE HAN*. (3)_____.

(2) *Dan Stanger*. (4)_____.

Date of Interview: *01 July 2016*.

Type: ☒ Telephonic ☐ Video Conference
☐ Personal [copy given to: ☐ applicant ☐ applicant's representative]

Exhibit shown or demonstration conducted: ☐ Yes ☐ No.
If Yes, brief description: _____.

Issues Discussed ☐101 ☐112 ☐102 ☒103 ☐Others
(For each of the checked box(es) above, please describe below the issue and detailed description of the discussion)

Claim(s) discussed: *1 and 4*.

Identification of prior art discussed: *Mukherjee et al. (US Pub. 2007/0097904)*.

Substance of Interview
(For each issue discussed, provide a detailed description and indicate if agreement was reached. Some topics may include: identification or clarification of a reference or a portion thereof, claim interpretation, proposed amendments, arguments of any applied references etc...)

Agreement was reached on the proposed amendment including "determining that the access point is an authenticated access point based at least in part on the information in the probe response frame indicating that the access point was connected with the end device previous to the access point receiving the probe request frame; and transmitting, to the access point determined to be an authenticated access point, a connection request including an authentic device identifier for the end device" would overcome the prior art in the record. It was also discussed amending the dependent claim 4 into "and" form requiring both conditions from current "or" form requiring only one of the conditions.

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

☐ Attachment

/CLEMENCE HAN/ Primary Examiner, Art Unit 2414	

Summary of Record of Interview Requirements

Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record
A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews
Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

37 CFR §1.2 Business to be transacted in writing.
All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiners Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:
- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case. It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items:
1) A brief description of the nature of any exhibit shown or any demonstration conducted,
2) an identification of the claims discussed,
3) an identification of the specific prior art discussed,
4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
5) a brief identification of the general thrust of the principal arguments presented to the examiner,
   (The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
6) a general indication of any other pertinent matters discussed, and
7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 13/885,754
Filing Date ..... May 16, 2013
Confirmation No. 1482
First Named Inventor ..... Hyoung-Gon LEE
Group Art Unit 2414
Examiner ..... Clemence S. Han
Attorney Docket No. 2582.737BS
Title: ..... SCHEMES FOR CONNECTING TO WIRELESS NETWORK

RESPONSE TO NON-FINAL OFFICE ACTION OF APRIL 19, 2016

To: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, VA 22313-1450

From: Daniel J. Stanger
Customer No. 86636
Brundidge & Stanger, PC
2318 Mill Road, Suite 1020
Alexandria, VA 22314

Sir:

In response to the Non-final Office Action dated April 19, 2016, for which the three-month shortened statutory period for response is set to expire on July 19, 2016, the following amendments and remarks are respectfully submitted. Favorable consideration is respectfully requested.

The Commissioner is hereby authorized to charge any deficiency of fees and credit any overpayments to Deposit Account Number 50-4888.

INTRODUCTORY COMMENTS

A **Listing of the Claims** begins on page 3.

Remarks begin on page 9.

LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims pending:

- At time of the Action: **Claims 1 - 5, 7 - 12, and 14 - 25**
- After this Reply: **Claims 1 - 5, 7 - 12, and 14 - 25**

Currently Canceled or Withdrawn Claims: None

Currently Amended Claims: **Claims 1, 4, 9, 11, 16, 19, 20, and 25**

New Claims: None

1. (**Currently Amended**) A method performed under control of an end device, comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame including the fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining ~~whether~~ that the access point is an authenticated access point based at least in part on the information ~~regarding the access point~~ in the probe response frame indicating that the access point was connected with the end device previous to the access point receiving the probe request frame; and

transmitting, to the access point determined to be an authenticated access point, a connection request including an authentic device identifier for the end device.

2. (**Original**) The method of Claim 1**,** further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (**Original**) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. (**Currently Amended**) The method of Claim ~~2~~1, wherein the determining includes determining that the access point is an authenticated access point based at least in part on ~~at least one of~~ the information in the probe response frame indicating that the access point ~~being~~ is controlled ~~by a~~ by the mobile operating server ~~or~~ and the access point being previously connected with the end device.

5. (**Original**) The method of Claim 1**,** further comprising:

generating the fake device identifier before transmitting the probe request frame.

6. (**Canceled**)

7. (**Original**) The method of Claim 1, wherein the fake device identifier includes at least one of a random number or a random character.

8. (**Original**) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (**Currently Amended**) The method of Claim 1, further comprising:

receiving, from ~~a~~ the mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. (**Original**) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (**Currently Amended**) An end device, comprising:

a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier;

a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine ~~whether~~ that the access point is an authenticated access point based at least in part on the information regarding the access point ~~or authenticated access point list~~ indicating that the access point was connected with the end device previous to the access point receiving the probe request frame from the transmitter; and

a connecting unit configured to connect to a wireless local area network provided by the access point,

wherein the receiving unit is further configured to receive the fake device identifier from a mobile operating server,

wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and

wherein the receiving unit is further configured to receive, from the access point, an approval of the connection request.

12. (**Original**) The end device of Claim 11, further comprising:

a fake device identifier generating unit configured to generate the fake device identifier.

13. (**Canceled**)

14. (**Original**) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (**Original**) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (**Currently Amended**) The end device of Claim 11, wherein the determination unit is further configured to determine ~~whether~~ that the access point is an authenticated access point based at least in part on the information regarding the access point ~~is~~ being included in the authenticated access point list.

17. (**Original**) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (**Original**) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (**Currently Amended**) The end device of Claim 11, wherein the determination unit is further configured to determine that the access point is an authenticated access point based at least in part on ~~at least one of~~ the information in the probe response frame indicating that the access point ~~being~~ is controlled by ~~a~~ the mobile operating server ~~or~~ and the access point being previously connected with the end device.

20. (**Currently Amended**) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform operations, comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame including the fake device identifier for the end device;

receiving, from the access point, a probe response frame including information regarding the access point;

determining ~~whether~~ that the access point is an authenticated access point based at least in part on the information ~~regarding the access point~~ in the probe response frame indicating that the access point was connected with the end device previous to the access point receiving the probe request frame; and

transmitting, to the access point determined to be an authenticated access point, a connection request including an authentic device identifier of the end device.

21. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

22. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

generating the fake device identifier.

23. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (**Previously Presented**) The non-transitory computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

25. (**Currently Amended**) The non-transitory computer-readable storage medium of Claim 20, wherein the determining includes determining that the access point is an authenticated access point based at least in part on ~~at least one of~~ the information in the probe response frame indicating that the access point ~~being~~ is controlled by ~~a~~ the mobile operating server ~~or~~ and the access point being previously connected with the end device.

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1 - 5, 7 - 12, and 14 - 25 are pending. **Claims 4, 9, 19 and 25** are objected to. **Claims 1 - 5, 7 - 12, and 14 - 25** were rejected under 35 U.S.C. § 103(a). **Claims 1, 4, 9, 11, 16, 19, 20, and 25** are currently amended. Support for the amendments to independent **Claims 1, 11, and 20** can be found, for example, in **Claims 4, 19, and 25**. No new matter is added.

INTERVIEW

Applicant's representative thanks the Examiner for the courtesies extended during the telephone interview held on July 1, 2016, during which **Claim 4** was discussed. The Examiner and Applicant's representative agreed that an amendment to add the second feature recited in **Claim 4** ("wherein the determining includes determining that the access point is an authenticated access point based at least in part on ... the access point being previously connected with the end device") to the independent claims would overcome the outstanding rejections under 35 U.S.C. § 103(a), discussed below. Applicant's representative notes that the first feature recited in **Claim 4** ("wherein the determining includes determining that the access point is an authenticated access point based at least in part on ... the access point being controlled by a mobile operating server") remains, but by virtue of the amendment is now recited in conjunction with the second feature rather than in the alternative. **Claims 19 and 25** recite similar subject matter.

CLAIM OBJECTIONS

> ***Claim 4*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*

> ***Claim 9*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 2 should be replaced with 'the mobile operating server'."*
>
> ***Claim 19*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*
>
> ***Claim 25*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*

In response to the objections, Applicant amends **Claims 4, 9, 19, and 25** to adopt the suggestions. Reconsideration and withdrawal of the objections are respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

The outstanding Office Action includes the following rejections under 35 U.S.C. § 103(a):

a) ***Claims 1 - 3, 5, 7, 8 and 20 - 24*** *are rejected as allegedly being unpatentable over Jalfon et al. (U.S. Publication No. 2012/0076072; hereafter "Jalfon").*

b) ***Claims 4, 11, 12, 14 - 19 and 25*** *are rejected as allegedly being unpatentable over Jalfon, in view of Mukherjee et al. (U.S. Publication No. 2007/0097904; hereafter "Mukherjee").*

c) ***Claims 9 and 10*** *are rejected as allegedly being unpatentable over Jalfon, in view of Lee et al. (U.S. Publication No. 2006/0150250; hereafter "Lee").*

Applicant traverses rejections a) - c), and respectfully requests that the rejections be reconsidered and withdrawn.

a) Claims 1 - 3, 5, 7, 8 and 20 - 24 *are rejected as allegedly being unpatentable over Jalfon et al. (U.S. Publication No. 2012/0076072; hereafter "Jalfon").*

b) Claims 4, 11, 12, 14 - 19 and 25 *are rejected as allegedly being unpatentable over Jalfon, in view of Mukherjee et al. (U.S. Publication No. 2007/0097904; hereafter "Mukherjee").*

Jalfon describes a system and method for maintaining privacy in a wireless network, and in particular to a system and method addressing network security issues in which "data may be susceptible to being intercepted by another, possibly hostile, wireless communication device" (paragraph [0003]). As disclosed in paragraph [0020],

> [0020] According to embodiments of the invention, a randomly or pseudo randomly selected or generated MAC address may be used by a wireless communication device during a first period of time, e.g., during a phase of searching for a wireless access point (AP) and an allocated MAC address may be used during a second time period, e.g., when and/or after actually connecting to an AP. Accordingly, a MAC address allocated to a wireless communication device as described herein may not be openly transmitted, broadcasted or sent over a wireless network until after an AP or another wireless communication device, with which the wireless communication device whishes [*sic*] to communicate, is located.

In a cooperative effort to advance prosecution of the application to allowance (for the *third* time), Applicant amends independent **Claim 1** to add subject matter previously recited in **Claim 4**. With emphasis added to the language imported from **Claim 4**, **Claim 1** now recites:

> 1. A method performed under control of an end device, comprising:
>
> receiving a fake device identifier from a mobile operating server;
>
> transmitting, to an access point, a probe request frame including the fake device identifier for the end device;
>
> receiving, from the access point, a probe response frame including information regarding the access point;
>
> determining that the access point is an authenticated access point based at least in part on the information in the probe response frame indicating that ***the access point was connected with the end device previous to the access point receiving the probe request frame***; and
>
> transmitting, to the access point determined to be an authenticated access point, a connection request including an authentic device identifier for the end device.

In rejecting **Claim 4**, the Office Action acknowledges, "Jalfon, however, does not teach determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously

connected with the end device," but cites Mukherjee with respect to these features, referring specifically to paragraph [0032] of the publication.

Considering **Claim 4** and paragraph [0032], Applicant respectfully submits that Mukherjee neither teaches nor suggests "determining that the access point is an authenticated access point based at least in part on ... the access point being previously connected with the end device." Rather, Mukherjee appears to disclose a token (password) authentication scheme by which wireless nodes 60 and access points 70 operate with "active authentication" (paragraph [0025]) without regard to their connection history. As disclosed in paragraphs [0026] - [0032]:

> [0026] When a wireless node 60 connects to the distribution system, a user name and authentication token (e.g., a password) is entered. This information is passed to the authentication server 90. The authentication server 90 checks that the information is correct. Also connected to the distribution system is the Internet or other LAN resources 100. **The access point 70 and the wireless nodes 60 operate based upon a PSK or 802.1x protocol, for example.**
>
> [0027] As will be discussed in greater detail below, the access point 70 and each wireless node 60 have a respective authentication token and address associated therewith. The access point 70 and wireless nodes 60 communicate using packets. Each packet comprises an authentication token, an origination address and a destination address. The addresses may be MAC addresses, for example.
>
> **[0028] During the communicating, the access point 70 reads and stores the respective authentication tokens and origination addresses wirelessly transmitted from the wireless nodes 60 for defining an allowed wireless node list 72. Each wireless node 60 reads and stores the authentication token and origination address wirelessly transmitted from the access point 70 for defining an allowed access point list 62.**
>
> [0029] A wireless node 60 does not associate with an access point 70 if **both an authentication token and an address for that access point are not on the allowed access point list 62**. Similarly, an access point 70 does not associate with anyone of the wireless nodes 60 **if both an authentication token and an address for that wireless node are not on the allowed wireless node list 72.**
>
> [0030] An advantage of the present invention is that wireless nodes 60 actively deal with an attacker 75 trying to impersonate an access point

> 70 by reading an additional field, i.e., the originating address, of the packets transmitted by the attacker. The access point 70 also actively deals with an attacker 65 trying to impersonate a wireless node 60 by reading the originating address of the packets transmitted by the attacker This gain in security is achieved with relatively minor modifications to the software and middleware of network cards in the wireless devices.
>
> [0031] Block diagrams of the access point 70 and a wireless node 60 will now be discussed in reference to FIGS. 2 and 3. The access point 70 includes an antenna 71, and a transceiver 74 coupled to the antenna. When the access point 70 receives packets from the wireless nodes 60, the respective authentication tokens and origination addresses for each respective wireless node 60 are stored in a memory 76 coupled to the transceiver 74. **The respective authentication tokens and origination addresses are used to define the allowed wireless node list 72** that is also stored in the memory 76. A controller 78 is coupled to the memory 76 and transceiver 74. The controller 78 causes the transceiver 74 not to associate with a wireless node 65 if **both an authentication token and an address for that wireless node are not on the allowed wireless node list.** This wireless node 65 is an attacker or impersonating node.
>
> [0032] Similarly, each wireless node 60 includes an antenna 61, transceiver 64, a memory and a controller 68. When the wireless node 60 receives packets from the access point 70, the respective authentication tokens and origination addresses for the access point are stored in the memory 66 coupled to the transceiver 64. An antenna 61 is coupled to the transceiver 64. **The respective authentication tokens and origination addresses are used to define the allowed access point list 62** that is also stored in the memory 66. The controller 68 causes the transceiver 64 not to associate with an access point 75 if **both an authentication token and an address for that access point are not on the allowed access point list.** This access point 75 is an attacker or impersonating access point.

(Emphasis added.)

The foregoing paragraphs illustrate Mukherjee's objective, namely to secure communications between wireless nodes and access points. In particular, paragraph [0032] discloses nothing related to previous connections between an access point and an end device, much less determining that the access point is an authenticated access point based at least in part on the access point being previously connected with the end device.

In addition, the alleged combination of Mukherjee with Jalfon does not suggest amended **Claim 1**, at least because Mukherjee does not disclose determining that the access point is an authenticated access point ***based at least in part on the access point being previously connected with the end device***. At most, the combination may suggest modifying Jalfon to include Mukherjee's authentication scheme to provide security to wireless node - access point communications. There is no suggestion in either publication to secure end device - access point communication in the manner recited in amended **Claim 1**.

For at least the foregoing reasons, Jalfon and Mukherjee, alone or in combination, fail to teach or suggest every element recited in **Claim 1.** Accordingly, a *prima facie* case of obviousness cannot be established by Jalfon in view of Mukherjee.

Furthermore, independent **Claims 11 and 20** have been amended in a similar manner and are thus patentable at least by a similar argument. Reconsideration and withdrawal of the rejection of **Claims 1, 11, and 20** are thus respectfully requested.

Claims 2 - 5, 7, 8, 12, 14 - 19, and 21 - 25 are dependent claims that inherit the patentability of the independent claim from which each is derived. For at least the foregoing reasons, then, Jalfon and Mukherjee, alone or in combination, fail to teach or suggest every element recited in **Claims 2 - 5, 7, 8, 14 - 19, and 21 - 25.** Accordingly, a *prima facie* case of the obviousness of **Claims 2 - 5, 7, 8, 12, 14 - 19, and 21 - 25** cannot be established by Jalfon in view of Mukherjee.

In accordance with the foregoing arguments, reconsideration and withdrawal of rejections a) and b) are respectfully requested.

c) Claims 9 and 10 *are rejected as allegedly being unpatentable over Jalfon, in view of Lee et al. (U.S. Publication No. 2006/0150250; hereafter "Lee").*

Claims 9 and 10 are dependent claims that inherit the patentability of the independent **Claim 1**. For at least the foregoing reasons, then, Jalfon and Lee, alone or in combination, fail to teach or suggest

every element recited in **Claims 9 and 10**. Accordingly, a *prima facie* case of obviousness cannot be established by Jalfon in view of Lee. In accordance with the foregoing arguments, reconsideration and withdrawal of rejection c) are respectfully requested.

CONCLUSION

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and therefore early and forthright issuance of a Notice to that effect is earnestly solicited.

Respectfully submitted,

Brundidge & Stanger, PC

Dated: July 8, 2016

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested.

Claims 1 - 5, 7 - 12, and 14 - 25 are pending. **Claims 4, 9, 19 and 25** are objected to. **Claims 1 - 5, 7 - 12, and 14 - 25** were rejected under 35 U.S.C. § 103(a). **Claims 1, 4, 9, 11, 16, 19, 20, and 25** are currently amended. Support for the amendments to independent **Claims 1, 11, and 20** can be found, for example, in **Claims 4, 19, and 25**. No new matter is added.

INTERVIEW

Applicant's representative thanks the Examiner for the courtesies extended during the telephone interview held on July 1, 2016, during which **Claim 4** was discussed. The Examiner and Applicant's representative agreed that an amendment to add the second feature recited in **Claim 4** ("wherein the determining includes determining that the access point is an authenticated access point based at least in part on ... the access point being previously connected with the end device") to the independent claims would overcome the outstanding rejections under 35 U.S.C. § 103(a), discussed below. Applicant's representative notes that the first feature recited in **Claim 4** ("wherein the determining includes determining that the access point is an authenticated access point based at least in part on ... the access point being controlled by a mobile operating server") remains, but by virtue of the amendment is now recited in conjunction with the second feature rather than in the alternative. **Claims 19 and 25** recite similar subject matter.

CLAIM OBJECTIONS

> ***Claim 4*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*

> ***Claim 9*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 2 should be replaced with 'the mobile operating server'."*
>
> ***Claim 19*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*
>
> ***Claim 25*** *is objected to as reciting the following alleged informalities: "'a mobile operating server' in line 3 should be replaced with 'the mobile operating server'."*

In response to the objections, Applicant amends **Claims 4, 9, 19, and 25** to adopt the suggestions. Reconsideration and withdrawal of the objections are respectfully requested.

CLAIM REJECTIONS UNDER 35 U.S.C. § 103(a)

The outstanding Office Action includes the following rejections under 35 U.S.C. § 103(a):

a) ***Claims 1 - 3, 5, 7, 8 and 20 - 24*** *are rejected as allegedly being unpatentable over Jalfon et al. (U.S. Publication No. 2012/0076072; hereafter "Jalfon").*

b) ***Claims 4, 11, 12, 14 - 19 and 25*** *are rejected as allegedly being unpatentable over Jalfon, in view of Mukherjee et al. (U.S. Publication No. 2007/0097904; hereafter "Mukherjee").*

c) ***Claims 9 and 10*** *are rejected as allegedly being unpatentable over Jalfon, in view of Lee et al. (U.S. Publication No. 2006/0150250; hereafter "Lee").*

Applicant traverses rejections a) - c), and respectfully requests that the rejections be reconsidered and withdrawn.

a) Claims 1 - 3, 5, 7, 8 and 20 - 24 *are rejected as allegedly being unpatentable over Jalfon et al. (U.S. Publication No. 2012/0076072; hereafter "Jalfon").*

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Jalfon describes a system and method for maintaining privacy in a wireless network, and in particular to a system and method addressing network security issues in which "data may be susceptible to being intercepted by another, possibly hostile, wireless communication device" (paragraph [0003]). As disclosed in paragraph [0020],

> [0020] According to embodiments of the invention, a randomly or pseudo randomly selected or generated MAC address may be used by a wireless communication device during a first period of time, e.g., during a phase of searching for a wireless access point (AP) and an allocated MAC address may be used during a second time period, e.g., when and/or after actually connecting to an AP. Accordingly, a MAC address allocated to a wireless communication device as described herein may not be openly transmitted, broadcasted or sent over a wireless network until after an AP or another wireless communication device, with which the wireless communication device whishes [*sic*] to communicate, is located.

In a cooperative effort to advance prosecution of the application to allowance (for the *third* time), Applicant amends independent **Claim 1** to add subject matter previously recited in **Claim 4**. With emphasis added to the language imported from **Claim 4**, **Claim 1** now recites:

> 1. A method performed under control of an end device, comprising:
>
> receiving a fake device identifier from a mobile operating server;
>
> transmitting, to an access point, a probe request frame including the fake device identifier for the end device;
>
> receiving, from the access point, a probe response frame including information regarding the access point;
>
> determining that the access point is an authenticated access point based at least in part on the information in the probe response frame indicating that ***the access point was connected with the end device previous to the access point receiving the probe request frame***; and
>
> transmitting, to the access point determined to be an authenticated access point, a connection request including an authentic device identifier for the end device.

In rejecting **Claim 4**, the Office Action acknowledges, "Jalfon, however, does not teach determining that the access point is an authenticated access point based at least in part on at least one of the access point being controlled by a mobile operating server or the access point being previously

connected with the end device," but cites Mukherjee with respect to these features, referring specifically to paragraph [0032] of the publication.

Considering **Claim 4** and paragraph [0032], Applicant respectfully submits that Mukherjee neither teaches nor suggests "determining that the access point is an authenticated access point based at least in part on ... the access point being previously connected with the end device." Rather, Mukherjee appears to disclose a token (password) authentication scheme by which wireless nodes 60 and access points 70 operate with "active authentication" (paragraph [0025]) without regard to their connection history. As disclosed in paragraphs [0026] - [0032]:

> [0026] When a wireless node 60 connects to the distribution system, a user name and authentication token (e.g., a password) is entered. This information is passed to the authentication server 90. The authentication server 90 checks that the information is correct. Also connected to the distribution system is the Internet or other LAN resources 100. **The access point 70 and the wireless nodes 60 operate based upon a PSK or 802.1x protocol, for example.**
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> [0027] As will be discussed in greater detail below, the access point 70 and each wireless node 60 have a respective authentication token and address associated therewith. The access point 70 and wireless nodes 60 communicate using packets. Each packet comprises an authentication token, an origination address and a destination address. The addresses may be MAC addresses, for example.
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> **[0028] During the communicating, the access point 70 reads and stores the respective authentication tokens and origination addresses wirelessly transmitted from the wireless nodes 60 for defining an allowed wireless node list 72. Each wireless node 60 reads and stores the authentication token and origination address wirelessly transmitted from the access point 70 for defining an allowed access point list 62.**
>
> [0029] A wireless node 60 does not associate with an access point 70 if **both an authentication token and an address for that access point are not on the allowed access point list 62**. Similarly, an access point 70 does not associate with anyone of the wireless nodes 60 **if both an authentication token and an address for that wireless node are not on the allowed wireless node list 72.**
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> [0030] An advantage of the present invention is that wireless nodes 60 actively deal with an attacker 75 trying to impersonate an access point

> 70 by reading an additional field, i.e., the originating address, of the packets transmitted by the attacker. The access point 70 also actively deals with an attacker 65 trying to impersonate a wireless node 60 by reading the originating address of the packets transmitted by the attacker This gain in security is achieved with relatively minor modifications to the software and middleware of network cards in the wireless devices.
>
> [0031] Block diagrams of the access point 70 and a wireless node 60 will now be discussed in reference to FIGS. 2 and 3. The access point 70 includes an antenna 71, and a transceiver 74 coupled to the antenna. When the access point 70 receives packets from the wireless nodes 60, the respective authentication tokens and origination addresses for each respective wireless node 60 are stored in a memory 76 coupled to the transceiver 74. **The respective authentication tokens and origination addresses are used to define the allowed wireless node list 72** that is also stored in the memory 76. A controller 78 is coupled to the memory 76 and transceiver 74. The controller 78 causes the transceiver 74 not to associate with a wireless node 65 if **both an authentication token and an address for that wireless node are not on the allowed wireless node list.** This wireless node 65 is an attacker or impersonating node.
>
> [0032] Similarly, each wireless node 60 includes an antenna 61, transceiver 64, a memory and a controller 68. When the wireless node 60 receives packets from the access point 70, the respective authentication tokens and origination addresses for the access point are stored in the memory 66 coupled to the transceiver 64. An antenna 61 is coupled to the transceiver 64. **The respective authentication tokens and origination addresses are used to define the allowed access point list 62** that is also stored in the memory 66. The controller 68 causes the transceiver 64 not to associate with an access point 75 if **both an authentication token and an address for that access point are not on the allowed access point list.** This access point 75 is an attacker or impersonating access point.

(Emphasis added.)

The foregoing paragraphs illustrate Mukherjee's objective, namely to secure communications between wireless nodes and access points. In particular, paragraph [0032] discloses nothing related to previous connections between an access point and an end device, much less determining that the access point is an authenticated access point based at least in part on the access point being previously connected with the end device.

In addition, the alleged combination of Mukherjee with Jalfon does not suggest amended **Claim 1**, at least because Mukherjee does not disclose determining that the access point is an authenticated access point ***based at least in part on the access point being previously connected with the end device***. At most, the combination may suggest modifying Jalfon to include Mukherjee's authentication scheme to provide security to wireless node - access point communications. There is no suggestion in either publication to secure end device - access point communication in the manner recited in amended **Claim 1**.

For at least the foregoing reasons, Jalfon and Mukherjee, alone or in combination, fail to teach or suggest every element recited in **Claim 1.** Accordingly, a *prima facie* case of obviousness cannot be established by Jalfon in view of Mukherjee.

Furthermore, independent **Claims 11 and 20** have been amended in a similar manner and are thus patentable at least by a similar argument. Reconsideration and withdrawal of the rejection of **Claims 1, 11, and 20** are thus respectfully requested.

Claims 2 - 5, 7, 8, 12, 14 - 19, and 21 - 25 are dependent claims that inherit the patentability of the independent claim from which each is derived. For at least the foregoing reasons, then, Jalfon and Mukherjee, alone or in combination, fail to teach or suggest every element recited in **Claims 2 - 5, 7, 8, 14 - 19, and 21 - 25.** Accordingly, a *prima facie* case of the obviousness of **Claims 2 - 5, 7, 8, 12, 14 - 19, and 21 - 25** cannot be established by Jalfon in view of Mukherjee.

In accordance with the foregoing arguments, reconsideration and withdrawal of rejections a) and b) are respectfully requested.

c) Claims 9 and 10 *are rejected as allegedly being unpatentable over Jalfon, in view of Lee et al. (U.S. Publication No. 2006/0150250; hereafter "Lee").*

Claims 9 and 10 are dependent claims that inherit the patentability of the independent **Claim 1**. For at least the foregoing reasons, then, Jalfon and Lee, alone or in combination, fail to teach or suggest

every element recited in **Claims 9 and 10**. Accordingly, a *prima facie* case of obviousness cannot be established by Jalfon in view of Lee. In accordance with the foregoing arguments, reconsideration and withdrawal of rejection c) are respectfully requested.

CONCLUSION

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and therefore early and forthright issuance of a Notice to that effect is earnestly solicited.

Respectfully submitted,

Brundidge & Stanger, PC

Dated: July 8, 2016

/Daniel J. Stanger/
Daniel J. Stanger
Reg. No. 32,846

Electronic Acknowledgement Receipt

EFS ID:	26295727
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger/Mariah Duell
Filer Authorized By:	Daniel John Stanger
Attorney Docket Number:	2582.737BS
Receipt Date:	08-JUL-2016
Filing Date:	16-MAY-2013
Time Stamp:	14:59:15
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment/Req. Reconsideration-After Non-Final Reject	KR-839496-02-US-NAT_20160708_ThirdOA_response.pdf	137841 7579df57e68df382991c4138c00d00a8819bd6f0	no	16

Warnings:

Information:	
Total Files Size (in bytes):	137841

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/885,754	Filing Date 05/16/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT **07/08/2016**

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	* 23	Minus	** 24	= 0	X $80 =	0
Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	0

AMENDMENT

	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
☐ Application Size Fee (37 CFR 1.16(s))						
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/JULIET MCMILLAN/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 10/18/2016

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
10/18/2016	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

Period for Reply

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

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

Status

1)☒ Responsive to communication(s) filed on *07/08/2016*.

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

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

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

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

Disposition of Claims*

5)☒ Claim(s) *1-5,7-12 and 14-25* is/are pending in the application.

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

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-3,5,7-12,14-18 and 20-24* is/are rejected.

8)☒ Claim(s) *4,19 and 25* is/are objected to.

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

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

Application Papers

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

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

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

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

Priority under 35 U.S.C. § 119

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

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

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

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

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

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

Attachment(s)

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

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

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

4) ☐ Other: _____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Claim Rejections - 35 USC § 103

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

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

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

4. Claims 1-3, 5, 7, 8 and 20-24 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. (US Pub. 2012/0076072) in view of Wang et al. (US Pub. 2013/0176897).

Regarding claim 1 and 20, Jalfon teaches a method performed under control of an end device, comprising: transmitting, to an access point, a probe request frame including a fake device identifier for the end device (step 410 in Figure 4); receiving, from the access point, a probe response frame including information regarding the

access point (step 415 in Figure 4); determining that the access point is an authenticated access point based at least in part on the information regarding the access point (step 420 in Figure 4); and transmitting, to the access point, a connection request including an authentic device identifier for the end device (step 425 in Figure 4). Jalfon does not specifically disclose a “mobile operating server” provides the fake device identifier (MAC address) to the end device. Jalfon teaches "In some embodiment, a pool of addresses may be provided to the wireless communication device A ... In other embodiment ... device A may ... generate such addresses" [0034]. Therefore, using a “mobile operating server” to provide the fake device identifier to the end device would have been an obvious variation of Jalfon teaching. Using a “mobile operating server” with Jalfon to provide the fake device identification would have produced expected results from performing the function in a server, such as centralized control of the fake ID generation/list, ensuring plural end devices do not use the same fake ID, etc. Jalfon, however, also does not teach the information in the probe response frame indicating that the access point was connected with the end device previous to the access point receiving the probe request frame. Wang teaches the information in the probe response frame indicating that the access point was connected with the end device previous to the access point receiving the probe request frame (“I-KNOW-YOU” in step 750 in Figure7 and step 840 in Figure 8). It would have been obvious to one skilled in the art to modify Jalfon to have the information in the probe response frame indicating that the access point was connected with the end device previous to the

access point receiving the probe request frame as taught by Wang in order to achieve accelerated link setup (Abstract).

Regarding claim 2 and 21, Jalfon teaches receiving, from the access point, an approval of the connection request (step 425 in Figure 4); and connecting to a wireless local area network 140 provided by the access point 130.

Regarding claim 3 and 24, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

Regarding claim 5 and 22, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 7, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 8 and 23, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

5. Claims 11, 12, 14 and 15-18 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Wang et al. and further in view of Mukherjee et al. (US Pub. 2007/0097904).

Regarding claim 11, Jalfon teaches an end device, comprising: a transmitting unit configured to transmit, to an access point, a probe request frame including a fake device identifier (step 410 in Figure 4); a receiving unit configured to receive, from the access point, a probe response frame including information regarding the access point (step 415 in Figure 4); a determination unit configured to determine whether the access

point is an authenticated access point based at least in part on the information regarding the access point or the authenticated access point list (step 420 in Figure 4); and a connecting unit configured to connect to a wireless local area network 140 provided by the access point 130, wherein the transmitting unit is further configured to transmit, to the access point, a connection request including an authentic device identifier, and the receiving unit is further configured to receive, from the access point, an approval of the connection request (step 425 in Figure 4). Jalfon does not specifically disclose a “mobile operating server” provides the fake device identifier (MAC address) to the end device. Jalfon teaches "In some embodiment, a pool of addresses may be provided to the wireless communication device A ... In other embodiment ... device A may ... generate such addresses" [0034]. Therefore, using a “mobile operating server” to provide the fake device identifier to the end device would have been an obvious variation of Jalfon teaching. Using a “mobile operating server” with Jalfon to provide the fake device identification would have produced expected results from performing the function in a server, such as centralized control of the fake ID generation/list, ensuring plural end devices do not use the same fake ID, etc. Jalfon, however, also does not teach the information indicating that the access point was connected with the end device previous to the access point receiving the probe request frame from the transmitter. Wang teaches the information indicating that the access point was connected with the end device previous to the access point receiving the probe request frame from the transmitter (“I-KNOW-YOU” in step 750 in Figure7 and step 840 in Figure 8). It would have been obvious to one skilled in the art to modify

Jalfon to have the information indicating that the access point was connected with the end device previous to the access point receiving the probe request frame from the transmitter as taught by Wang in order to achieve accelerated link setup (Abstract). Jalfon in view Wang, however, does not teach a memory configured to store an authenticated access point list including information regarding at least one authenticated access point. Mukherjee teaches a memory 66 configured to store an authenticated access point list 62 including information regarding at least one authenticated access point. It would have been obvious to one skilled in the art to modify Jalfon in view of Wang to have a memory configured to store an authenticated access point list including information regarding at least one authenticated access point as taught by Mukherjee in order to avoid impersonating access point [0032].

Regarding claim 12, Jalfon teaches generating the fake device identifier before transmitting the probe request frame [0035].

Regarding claim 14, Jalfon teaches the fake device identifier includes at least one of a random number or a random character [0035].

Regarding claim 15, Jalfon teaches the authentic device identifier includes a media access control (MAC) address [0036].

Regarding claim 16, Mukherjee teaches the determination unit is further configured to determine that the access point is an authenticated access point based at least in part on the information regarding the access point being included in the authenticated access point list [0032].

Regarding claim 17, Mukherjee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0032].

Regarding claim 18, Jalfon teaches the access point includes a Wi-Fi access point 130, and the wireless local area network provided by the access point includes a Wi-Fi network 140 [0018], [0027].

6. Claims 9 and 10 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over Jalfon et al. in view of Wang et al. and further in view of Lee et al. (US Pub. 2006/0150250).

Regarding claim 9, Jalfon in view of Wang teaches the limitations cited in claim 1 as shown above. Jalfon in view of Wang, however, does not teach receiving, from the mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list. Lee teaches receiving, from the mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list (“authorized access point list … received from the wireless security management server 310” in [0070]). It would have been obvious to one skilled in the art to modify Jalfon in view of

Wang to receive, from the mobile operating server, an authenticated access point list including information regarding at least one authenticated access point, wherein the determining is further based at least in part on the authenticated access point list as taught by Lee in order to avoid attack from rogue access point [0067]-[0070].

Regarding claim 10, Lee teaches the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point [0102].

Allowable Subject Matter

7. Claims 4, 19 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

Notice of References Cited	Application/Control No. 13/885,754	Applicant(s)/Patent Under Reexamination LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2004/0264427 A1	12-2004	Jaakkola, Mikko	H04L29/12009	370/338
*	B	US-2007/0060128 A1	03-2007	Kil; Tae-Young	H04W88/08	455/436
*	C	US-2012/0201201 A1	08-2012	Liu; Changming	H04W12/04	370/328
*	D	US-2012/0230304 A1	09-2012	Barbu; Ion	H04W48/18	370/338
*	E	US-2013/0150012 A1	06-2013	CHHABRA; Kapil	H04W48/16	455/418
*	F	US-2013/0176897 A1	07-2013	Wang; Lei	H04W12/06	370/254
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch
(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08).cpc.	9/29/2016	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch
see Search History printout	8/7/2015	ch
see Search History printout	11/15/2015	ch
see Search History printout	4/16/2016	ch
(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08) see Search History printout	9/29/2016	ch
see Search History printout	9/29/2016	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	see Interference Search printout	2/1/2015	ch
	see Interference Search printout	11/15/2015	ch

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	11951	(trust$4 authenticat$4 authentic previous$4) near3 (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
L2	1614	"probe request" and "probe response" and 1	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
L3	931	2 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
L4	710	2 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
L5	1230	3 4	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
L6	8982	(trust$4 authenticat$4 authentic previous$4) near2 (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
L7	1051	5 and 6	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
L8	4824	(trust$4 authenticat$4 authentic previous$4) near (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
L9	607	5 and 8	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
L10	1855	previous$4 with connect$4 with (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:43
L11	117	9 and 10	US-PGPUB; USPAT	OR	ON	2016/09/29 09:43
L12	6	(US-20120201201-$ or US-20130176897-$ or US-20130150012-$ or US-20120230304-$ or US-20070060128-$ or US-20040264427-$).did.	US-PGPUB	OR	ON	2016/09/29 10:22
L13	6	previous$4 with connect$4 with (ap "access point") and 12	US-PGPUB; USPAT	OR	ON	2016/09/29 10:22
L14	62050	(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08).cpc.	US-PGPUB; USPAT	OR	ON	2016/09/29 11:07
L15	386	9 and 14	US-PGPUB; USPAT	OR	ON	2016/09/29 11:08
S1	15	hyoung-gon with lee.in.	US-	OR	ON	2014/10/19

			PGPUB; USPAT			23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24
S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device	US-	OR	ON	2015/01/19

		identifier" "device id")	PGPUB; USPAT			19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S23	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S24	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S25	10351	h04w12/06.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S26	8623	h04w84/12.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S27	7411	h04w88/08.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S28	31521	S23 S24 S25 S26 S27	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S29	581	"probe request frame" and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S30	1	"probe request frame" with fake and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S31	1	("20120076072").PN.	US-PGPUB; USPAT	OR	OFF	2015/04/10 10:19
S33	5015	(ap "access point") near3 list	US-PGPUB; USPAT	OR	ON	2015/04/12 15:25
S34	2159	fake with (address mac id identifier)	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S35	19	S33 and S34	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S36	17	S35 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S37	11	S35 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S38	17	S36 S37	US-PGPUB; USPAT	OR	ON	2015/04/12 15:50
S39	1196	(ap "access point") adj list	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S40	434	(ap "access point") adj list with (transmit$4	US-	OR	ON	2015/08/07

		receiv$4 send$4 forward$4)	PGPUB; USPAT			18:22
S41	333	S40 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S42	173	S40 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S43	376	S41 S42	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S44	33	(ap "access point") adj list with (approved allowed)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S46	11	S43 and S44	US-PGPUB; USPAT	OR	ON	2015/08/07 18:58
S47	56	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S48	37	S43 and S47	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S49	31	(mac media ssid) and S48	US-PGPUB; USPAT	OR	ON	2015/08/07 19:49
S50	460	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S51	339	S50 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S52	184	S50 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S53	390	S51 S52	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S54	61	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S55	37	S53 and S54	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S56	31	(mac media ssid) and S55	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S57	30	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2015/11/15 22:51
S60	33	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/04/16 11:32
S61	3	(("20070097904") or ("20120076072") or ("20060150250")).PN.	US-PGPUB; USPAT	OR	OFF	2016/04/16 11:33
S62	3	(("20070097904") or ("20120076072") or	US-	OR	OFF	2016/06/30

		("20060150250")).PN.	PGPUB; USPAT			20:04
S63	2	server and S62	US-PGPUB; USPAT	OR	ON	2016/06/30 20:04

9/29/2016 11:37:59 AM
C:\Users\chan\Documents\EAST\Workspaces\13885754.wsp

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Hyoung-Gon Lee	Examiner:	HAN, CLEMENCE S
Appl. No.:	13/885,754	Art Unit:	2414
Filed:	May 16, 2013	Confirmation No.:	1482
		Atty Docket No.:	2582.737BS

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

RESPONSE TO FINAL OFFICE ACTION ACCOMPANYING AFTER-FINAL CONSIDERATION PILOT (AFCP) 2.0 REQUEST

Dear Commissioner:

In response to the Final Office Action dated October 18, 2016, entry of the following amendments and consideration of the accompanying remarks being submitted along with an AFCP 2.0 request and a petition for one-month extension is respectfully requested.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method performed under control of an end device, the method comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame ~~including~~ that includes the fake device identifier for the end device;

receiving, from the access point, a probe response frame ~~including~~ that includes information regarding the access point;

determining that the access point is an authenticated access point based at least in part on the information in the probe response frame ~~indicating~~ that indicates that:

the access point is controlled by the mobile operating server, and

the access point was connected with the end device previous to when the access point ~~receiving~~ received the transmitted probe request frame; and

transmitting, to the access point determined to be [[an]]the authenticated access point, a connection request ~~including~~ that includes an authentic device identifier for the end device.

2. (Original) The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (Original) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4. (Canceled)

5. (Canceled)

6. (Canceled)

7. (Currently Amended) The method of Claim 1, wherein the receiving the fake device identifier includes receiving at least one of a random number or a random character.

8. (Original) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (Previously Presented) The method of Claim 1, further comprising:

receiving, from the mobile operating server, an authenticated access point list including information regarding at least one authenticated access point,

wherein the determining is further based at least in part on the authenticated access point list.

10. (Original) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (Currently Amended) An end device, comprising:

a ~~transmitting unit~~ transmitter configured to transmit, to an access point, a probe request frame ~~including~~ that includes a fake device identifier;

a ~~receiving unit~~ receiver configured to receive, from the access point, a probe response frame ~~including~~ that includes information regarding the access point;

a memory configured to store an authenticated access point list including information regarding at least one authenticated access point;

a determination unit configured to determine that the access point is [[an]]the at least one authenticated access point based at least in part on the information regarding the access point ~~indicating~~ that indicates that:

the access point is controlled by a mobile operating server, and

the access point was connected with the end device previous to when the access point ~~receiving~~ received the probe request frame transmitted from the transmitter; and

a ~~connecting~~ connection unit configured to connect to a wireless local area network provided by the access point,

wherein the ~~receiving unit~~ receiver is further configured to receive the fake device identifier from [[a]]the mobile operating server,

wherein the ~~transmitting unit~~ transmitter is further configured to transmit, to the access point, a connection request ~~including~~ that includes an authentic device identifier, and

wherein the ~~receiving unit~~ receiver is further configured to receive, from the access point, an approval of the connection request.

12. (Canceled)

13. (Canceled)

14. (Original) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (Original) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (Currently Amended) The end device of Claim 11, wherein the determination unit is further configured to determine that the access point is [[an]]the at least one authenticated access point based at least in part on the information regarding the access point ~~being~~ that is included in the authenticated access point list.

17. (Original) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (Original) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (Canceled)

20. (Currently Amended) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform or control performance of operations~~, comprising~~ that comprise:

~~receiving~~ obtain a fake device identifier from a mobile operating server;

~~transmitting~~transmit, to an access point, a probe request frame ~~including~~ that includes the fake device identifier for the end device;

~~receiving~~obtain, from the access point, a probe response frame ~~including~~ that includes information regarding the access point;

~~determining~~ determine that the access point is an authenticated access point based at least in part on the information in the probe response frame ~~indicating~~ that indicates that:

the access point is controlled by the mobile operating server, and

the access point was connected with the end device previous to when the access point ~~receiving~~ received the transmitted probe request frame; and

~~transmitting~~transmit, to the access point determined to be [[an]]the authenticated access point, a connection request ~~including~~ that includes an authentic device identifier of the end device.

21. (Currently Amended) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

~~receiving~~obtain, from the access point, an approval of the connection request; and

~~connecting~~ connect to a wireless local area network provided by the access point.

22. (Canceled)

23. (Previously Presented) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (Previously Presented) The non-transitory computer-readable storage medium of Claim 20, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

25. (Canceled)

REMARKS

Reconsideration and allowance of the above-identified application is respectfully requested. Claims 1-3, 7-11, 14-18, 20, 21, 23, and 24 are currently pending. Independent claims 1, 7, 11, 16, 20, and 21 have been currently amended. Claims 4, 5, 12, 19, 22, and 25 are canceled herein without prejudice. Claims 6 and 13 were previously canceled without prejudice. No new matter is added.

Allowable Subject Matter

The Office Action, on page 8, indicates that claims 4, 19, and 25 would be allowable if rewritten in independent form. The Examiner is thanked for the careful review of claims 4, 19, and 25. In the interest of expediting prosecution, and without conceding that independent claims 1, 11, and 20 as previously presented are anticipated or obvious, independent claims 1, 11, and 20 have been amended to incorporate elements similar or identical to some or all of the elements of allowable dependent claims 4, 19, and 25 respectively, thereby rendering the rejection of independent claims 1, 11, and 20 moot.

The consideration of the amended claims and allowance of the application is respectfully requested.

Claim Rejections under 35 U.S.C. § 103

Claims 1-3, 5, 7, 8, and 20-24 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over US Patent Pub. No. 2012/0076072 (Jalfon) in view of US Patent Pub. No. 2013/0176897 (Wang).

In the interest of expediting prosecution and without conceding that independent claim 1, as previously presented, is anticipated or obvious, independent claim 1 has been amended to incorporate elements similar or identical to some or all of the elements of allowable dependent claim 4, rendering the rejection of independent claim 1 moot. Similarly, independent claim 20 has been amended to incorporate elements similar or identical to some or all of the elements of allowable dependent claim 25, rendering the rejection of independent claim 20 moot.

In view thereof, it is believed that independent claims 1 and 20, as amended, are allowable. The rights to present the pre-amendment claims at a later time, in this or a related application are expressly reserved.

Accordingly, it is respectfully requested that the rejection of independent claims 1 and 20 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Also, dependent claims 2-3, 7, 8, 21, 23, and 24 are also allowable at least by virtue of their dependency on respective amended independent claims 11 and 20, which have been shown to be allowable above, and as well as for their additional recitations. Therefore, it is respectfully requested that the rejection of dependent claims 2-3, 7, 8, 21, 23, and 24 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

The rejection of dependent claims 5 and 22 is moot in view of the cancellation of dependent claims 5 and 22.

Claims 11, 12, 14, and 15-18 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over US Patent Pub. No. 2012/0076072 (Jalfon) in view of US Patent Pub. No. 2013/0176897 (Wang) and further in view of US Patent Pub. No. 2007/0097904 (Mukherjee).

In the interest of expediting prosecution and without conceding that independent claim 11, as previously presented, is anticipated or obvious, independent claim 11 has been amended to incorporate elements similar or identical to some or all of the elements of allowable dependent claim 19, thereby rendering the rejection of independent claim 11 moot.

In view thereof, it is believed that independent claim 11, as amended, is allowable. The rights to present the pre-amendment claims at a later time, in this or a related application are expressly reserved.

Accordingly, it is respectfully requested that the rejection of independent claim 11 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Also, dependent claims 14 and 15-18 are also allowable at least by virtue of their dependency on amended independent claim 11, which has been shown to be allowable above, and as well as for their additional recitations. Therefore, it is respectfully requested that the rejection of dependent claims 14 and 15-18 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

The rejection of dependent claim 12 is moot in view of the cancellation of dependent claim 12.

Claims 9 and 10 are rejected under pre-AIA 35 U.S.C. § 103(a) as being unpatentable over US Patent Pub. No. 2012/0076072 (Jalfon) in view of US Patent Pub. No. 2013/0176897 (Wang) and further in view of US Patent Pub. No. 2006/0150250 (Lee).

Dependent claims 9 and 10 are also allowable at least by virtue of their dependency on independent claim 1, which has been shown to be allowable above, and as well as for their additional recitations. Therefore, it is respectfully requested that the rejection of dependent claims 9 and 10 under pre-AIA 35 U.S.C. § 103(a) be withdrawn.

Various other amendments are made to the claims as shown, so as to provide more appropriate antecedent basis, to more precisely recite the subject matter contained therein, to make the terminology more consistent within and between related claims, to address typographical/grammatical issues, and/or to otherwise place such claims in better form.

CONCLUSION

Therefore, in light of at least the foregoing, it is believed that the present application is in condition for allowance. As a result, issuance of a Notice of Allowance for the pending claims is respectfully requested.

The Examiner's consideration of these Amendments and Remarks is appreciated and the Examiner is cordially invited to contact the undersigned, should the Examiner have any questions, comments, or suggestions.

Please charge any fees that may be due to Deposit Account No. 50-4888.

Respectfully submitted,

Date: February 21, 2017

By: /Daniel J. Stanger/
Daniel J. Stanger
Registration No. 32,846
Attorney of Record
Customer No. 86636

Doc Code: A.NE.AFCP
Document Description: After Final Consideration Pilot Program Request

PTO/SB/434 (05-13)

CERTIFICATION AND REQUEST FOR CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0

Practitioner Docket No.:	Application No.:	Filing Date:
2582.737BS	13/885,754	05-16-2013
First Named Inventor:	**Title:**	
Hyoung-Gon Lee	SCHEMES FOR CONNECTING TO WIRELESS NETWORK	

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS CONSIDERATION UNDER THE AFTER FINAL CONSIDERATION PILOT PROGRAM 2.0 (AFCP 2.0) OF THE ACCOMPANYING RESPONSE UNDER 37 CFR 1.116.

1. The above-identified application is (i) an original utility, plant, or design nonprovisional application filed under 35 U.S.C. 111(a) [a continuing application (*e.g.*, a continuation or divisional application) is filed under 35 U.S.C. 111(a) and is eligible under (i)], or (ii) an international application that has entered the national stage in compliance with 35 U.S.C. 371(c).
2. The above-identified application contains an outstanding final rejection.
3. Submitted herewith is a response under 37 CFR 1.116 to the outstanding final rejection. The response includes an amendment to at least one independent claim, and the amendment does not broaden the scope of the independent claim in any aspect.
4. This certification and request for consideration under AFCP 2.0 is the only AFCP 2.0 certification and request filed in response to the outstanding final rejection.
5. Applicant is willing and available to participate in any interview requested by the examiner concerning the present response.
6. This certification and request is being filed electronically using the Office's electronic filing system (EFS-Web).
7. Any fees that would be necessary consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, extension of time fees, are being concurrently filed herewith. [There is no additional fee required to request consideration under AFCP 2.0.]
8. By filing this certification and request, applicant acknowledges the following:
   - Reissue applications and reexamination proceedings are not eligible to participate in AFCP 2.0.
   - The examiner will verify that the AFCP 2.0 submission is compliant, *i.e.*, that the requirements of the program have been met (see items 1 to 7 above). For compliant submissions:
     - The examiner will review the response under 37 CFR 1.116 to determine if additional search and/or consideration (i) is necessitated by the amendment and (ii) could be completed within the time allotted under AFCP 2.0. If additional search and/or consideration is required but cannot be completed within the allotted time, the examiner will process the submission consistent with current practice concerning responses after final rejection under 37 CFR 1.116, *e.g.*, by mailing an advisory action.
     - If the examiner determines that the amendment does not necessitate additional search and/or consideration, or if the examiner determines that additional search and/or consideration is required and could be completed within the allotted time, then the examiner will consider whether the amendment places the application in condition for allowance (after completing the additional search and/or consideration, if required). If the examiner determines that the amendment does not place the application in condition for allowance, then the examiner will contact the applicant and request an interview.
       - The interview will be conducted by the examiner, and if the examiner does not have negotiation authority, a primary examiner and/or supervisory patent examiner will also participate.
       - If the applicant declines the interview, or if the interview cannot be scheduled within ten (10) calendar days from the date that the examiner first contacts the applicant, then the examiner will proceed consistent with current practice concerning responses after final rejection under 37 CFR 1.116.

Signature	Date
/Daniel J. Stanger/	February 21, 2017
Name (Print/Typed) Daniel J. Stanger	**Practitioner Registration No.** 32,846

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

☐ * Total of _____ forms are submitted.

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

PTO/AIA/22 (03-13)
Approved for use through 7/31/2016. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional): 2582.737BS

Application Number: 13/885,754

Filed: May 16, 2013

For: Hyoung-Gon Lee

Art Unit: 2414

Examiner: HAN, CLEMENCE S

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	Fee	Small Entity Fee	Micro Entity Fee	
☑ One month (37 CFR 1.17(a)(1))	$200	$100	$50	$ 200.00
☐ Two months (37 CFR 1.17(a)(2))	$600	$300	$150	$
☐ Three months (37 CFR 1.17(a)(3))	$1,400	$700	$350	$
☐ Four months (37 CFR 1.17(a)(4))	$2,200	$1,100	$550	$
☐ Five months (37 CFR 1.17(a)(5))	$3,000	$1,500	$750	$

☐ Applicant asserts small entity status. See 37 CFR 1.27.

☐ Applicant certifies micro entity status. See 37 CFR 1.29.
Form PTO/SB/15A or B or equivalent must either be enclosed or have been submitted previously.

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director has already been authorized to charge fees in this application to a Deposit Account.

☑ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 50-4888.

☑ Payment made via EFS-Web.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

I am the

☐ applicant.

☑ attorney or agent of record. Registration number 32,846.

☐ attorney or agent acting under 37 CFR 1.34. Registration number _____.

/Daniel J. Stanger/ — Signature

February 21, 2017 — Date

Daniel J. Stanger — Typed or printed name

(703) 684-1470 — Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.

☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Privacy Act Statement

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

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Patent Application Fee Transmittal

Application Number:	13885754
Filing Date:	16-May-2013
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Filer:	Daniel John Stanger
Attorney Docket Number:	2582.737BS

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

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

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension - 1 month with $0 paid	1251	1	200	200
Miscellaneous:				
			Total in USD ($)	**200**

Electronic Acknowledgement Receipt

EFS ID:	28418124
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger/Mariah Duell
Filer Authorized By:	Daniel John Stanger
Attorney Docket Number:	2582.737BS
Receipt Date:	21-FEB-2017
Filing Date:	16-MAY-2013
Time Stamp:	17:06:36
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$200
RAM confirmation Number	022217INTEFSW17074800
Deposit Account	504888
Authorized User	Mariah Duell

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

37 CFR 1.492 (National application filing, search, and examination fees)

37 CFR 1.492(a) (Basic national fee only)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Response After Final Action	KR-839496-02-US-NAT_20170221_FinalOA_Response.pdf	56492 d96e2bf0d375d3ca6a43d61087908f5814fc7e66	no	10
Warnings:					
Information:					
2	After Final Consideration Program Request	KR-839496-02-US-NAT_20170221_AFCP.PDF	226585 2299ca0316c9e7ca847ea52001471799b6b7e95b	no	2
Warnings:					
Information:					
3	Extension of Time	KR-839496-02-US-NAT_20170221_Petition_for_EOT.pdf	163419 49b45b5e98a88aa8f2c8b1814a8b5c61cdf06841	no	2
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30714 e0f20745c4cb4b3bed44c52b57b0530c40bd2505	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	477210		

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

New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/885,754	Filing Date 05/16/2013	☐ To be Mailed

ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

	(Column 1)	(Column 2)		
FOR	NUMBER FILED	NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

		(Column 1)		(Column 2)	(Column 3)		
	02/21/2017	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	* 17	Minus	** 24	= 0	X $80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $420 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

		(Column 1)		(Column 2)	(Column 3)		
		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
AMENDMENT	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
BRENDA J. DENNY

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

UNITED STATES PATENT AND TRADEMARK OFFICE

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

NOTICE OF ALLOWANCE AND FEE(S) DUE

86636 7590 03/07/2017

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 03/07/2017

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	06/07/2017

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

86636 7590 03/07/2017
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission
I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	06/07/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAN, CLEMENCE S	2414	370-338000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.
1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. The following fee(s) are submitted:
- ❑ Issue Fee
- ❑ Publication Fee (No small entity discount permitted)
- ❑ Advance Order - # of Copies _____

4b. Payment of Fee(s): **(Please first reapply any previously paid issue fee shown above)**
- ❑ A check is enclosed.
- ❑ Payment by credit card. Form PTO-2038 is attached.
- ❑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ❑ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ❑ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ❑ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

UNITED STATES PATENT AND TRADEMARK OFFICE

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

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 03/07/2017

BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
ALEXANDRIA, VA 22314

EXAMINER	
HAN, CLEMENCE S	

ART UNIT	PAPER NUMBER
2414	

DATE MAILED: 03/07/2017

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

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

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/885,754	Applicant(s) LEE, HYOUNG-GON	
	Examiner CLEMENCE HAN	Art Unit 2414	AIA (First Inventor to File) Status No

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

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *02/21/2017*.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on_____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are *1-3, 7-11, 14-18, 20, 21, 23 and 24 now renumbered as 1-17 in order*. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some *c) ☐ None of the:
   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

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

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

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
5. ☐ Examiner's Amendment/Comment
6. ☒ Examiner's Statement of Reasons for Allowance
7. ☒ Other *PTO-2323*.

DETAILED ACTION

Allowable Subject Matter

1. Claims 1-3, 7-11, 14-18, 20, 21, 23 and 24 are allowed.

2. The following is an examiner's statement of reasons for allowance: The present invention is directed to a method for connecting to an authenticated access point.

3. Jalfon et al. (US Pub. 2012/0076072) teaches transmitting a probe request frame including the fake device identifier (Figure 4).

4. The prior arts in the record fail to teach or make obvious to a method comprising determining that the access point is an authenticated access point based at least in part on the information in the probe response frame that indicates that: both the access point is controlled by the mobile operating server, and the access point was connected with the end device previous to when the access point received the transmitted probe request frame within a structure of the claim. These features are claimed in the independent claims 1, 11 and 20 and render them allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CLEMENCE HAN whose telephone number is (571)272-3158. The examiner can normally be reached on Monday-Friday 8-4.

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

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on (571) 272-7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Hyoung-Gon Lee	Examiner:	HAN, CLEMENCE S
Appl. No.:	13/885,754	Art Unit:	2414
Filed:	May 16, 2013	Confirmation No.:	1482
OK TO ENTER: /C.S.H/		Atty Docket No.:	2582.737BS

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

RESPONSE TO FINAL OFFICE ACTION ACCOMPANYING AFTER-FINAL CONSIDERATION PILOT (AFCP) 2.0 REQUEST

Dear Commissioner:

In response to the Final Office Action dated October 18, 2016, entry of the following amendments and consideration of the accompanying remarks being submitted along with an AFCP 2.0 request and a petition for one-month extension is respectfully requested.

Amendments to the Claims are reflected in the listing of claims, which begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	12640	(trust$4 authenticat$4 authentic previous$4) near3 (ap "access point")	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L2	1775	"probe request" and "probe response" and L1	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L3	941	L2 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L4	782	L2 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L5	1305	L3 L4	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L6	5070	(trust$4 authenticat$4 authentic previous$4) near (ap "access point")	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L7	626	L5 and L6	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L8	68826	(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08).cpc.	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
L9	404	L7 and L8	US-PGPUB; USPAT	OR	ON	2017/03/05 19:39
S1	15	hyoung-gon with lee.in.	US-PGPUB; USPAT	OR	ON	2014/10/19 23:34
S2	10	("20030221006" | "20070286143" | "20080043686" | "20080052779" | "20110083165" | "20110314147" | "20120221955" | "7185204" | "7808958" | "8005458").PN.	US-PGPUB; USPAT	OR	ON	2014/10/20 00:40
S3	9292	authenticat$4 with ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:21
S4	251	fake with identifier	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S5	9	S3 and S4	US-PGPUB; USPAT	OR	ON	2014/10/20 01:22
S6	3769	authenticat$4 near2 ("access point" ap)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:24

S7	2393	authenticat$4 near2 "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S8	1299	authenticat$4 near "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S9	620	authenticat$4 adj "access point"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:25
S10	248	S9 AND ((370/338 OR 455/411 OR 455/410 OR 380/270 OR 380/247 OR 713/168 OR 726/3 OR 726/4 OR 726/2 OR 709/229 OR 709/225).CCLS.)	US-PGPUB; USPAT	OR	ON	2014/10/20 01:29
S11	240	S10 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S12	101	S10 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S13	244	S11 S12	US-PGPUB; USPAT	OR	ON	2014/10/20 01:30
S14	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2014/10/20 01:31
S15	39	"probe request" and "probe response" and S13	US-PGPUB; USPAT	OR	ON	2014/10/20 01:36
S16	5	(US-20130281056-$ or US-20130179943-$ or US-20120311328-$ or US-20120210395-$ or US-20090235077-$).did.	US-PGPUB	OR	ON	2014/10/20 01:40
S17	7	S14 S16	US-PGPUB	OR	ON	2014/10/20 01:41
S18	2	(US-20110083165-$ or US-20080052779-$).did.	US-PGPUB	OR	ON	2015/01/19 19:53
S19	1	"probe request" and "probe response" and S18	US-PGPUB; USPAT	OR	ON	2015/01/19 19:53
S20	3	"probe request frame" with ("device identifier" "device id")	US-PGPUB; USPAT	OR	ON	2015/01/19 19:59
S21	79	"probe request frame" with ("mac address")	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S22	1	"probe request frame" with ("mac address") with fake	US-PGPUB; USPAT	OR	ON	2015/01/19 20:02
S23	6962	h04w8/26.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S24	2572	h04w48/20.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:57
S25	10351	h04w12/06.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S26	8623	h04w84/12.cpc.	US-PGPUB;	OR	ON	2015/02/01 18:58

			USPAT			
S27	7411	h04w88/08.cpc.	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S28	31521	S23 S24 S25 S26 S27	US-PGPUB; USPAT	OR	ON	2015/02/01 18:58
S29	581	"probe request frame" and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S30	1	"probe request frame" with fake and S28	US-PGPUB; USPAT	OR	ON	2015/02/01 18:59
S31	1	("20120076072").PN.	US-PGPUB; USPAT	OR	OFF	2015/04/10 10:19
S33	5015	(ap "access point") near3 list	US-PGPUB; USPAT	OR	ON	2015/04/12 15:25
S34	2159	fake with (address mac id identifier)	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S35	19	S33 and S34	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S36	17	S35 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S37	11	S35 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/04/12 15:27
S38	17	S36 S37	US-PGPUB; USPAT	OR	ON	2015/04/12 15:50
S39	1196	(ap "access point") adj list	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S40	434	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:22
S41	333	S40 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S42	173	S40 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S43	376	S41 S42	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S44	33	(ap "access point") adj list with (approved allowed)	US-PGPUB; USPAT	OR	ON	2015/08/07 18:23
S46	11	S43 and S44	US-PGPUB; USPAT	OR	ON	2015/08/07 18:58
S47	56	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB;	OR	ON	2015/08/07 19:11

			USPAT			
S48	37	S43 and S47	US-PGPUB; USPAT	OR	ON	2015/08/07 19:11
S49	31	(mac media ssid) and S48	US-PGPUB; USPAT	OR	ON	2015/08/07 19:49
S50	460	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4)	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S51	339	S50 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S52	184	S50 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S53	390	S51 S52	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S54	61	(ap "access point") adj list with (transmit$4 receiv$4 send$4 forward$4) with server	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S55	37	S53 and S54	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S56	31	(mac media ssid) and S55	US-PGPUB; USPAT	OR	ON	2015/11/15 22:50
S57	30	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2015/11/15 22:51
S60	33	fake with (address mac id identifier) with (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/04/16 11:32
S61	3	(("20070097904") or ("20120076072") or ("20060150250")).PN.	US-PGPUB; USPAT	OR	OFF	2016/04/16 11:33
S62	3	(("20070097904") or ("20120076072") or ("20060150250")).PN.	US-PGPUB; USPAT	OR	OFF	2016/06/30 20:04
S63	2	server and S62	US-PGPUB; USPAT	OR	ON	2016/06/30 20:04
S64	11951	(trust$4 authenticat$4 authentic previous$4) near3 (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
S65	1614	"probe request" and "probe response" and S64	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
S66	931	S65 and @ad<"20121121"	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
S67	710	S65 and @rlad<"20121121"	US-PGPUB; USPAT	OR	ON	2016/09/29 09:35
S68	1230	S66 S67	US-PGPUB;	OR	ON	2016/09/29 09:35

			USPAT			
S69	8982	(trust$4 authenticat$4 authentic previous$4) near2 (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
S70	1051	S68 and S69	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
S71	4824	(trust$4 authenticat$4 authentic previous$4) near (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
S72	607	S68 and S71	US-PGPUB; USPAT	OR	ON	2016/09/29 09:36
S73	1855	previous$4 with connect$4 with (ap "access point")	US-PGPUB; USPAT	OR	ON	2016/09/29 09:43
S74	117	S72 and S73	US-PGPUB; USPAT	OR	ON	2016/09/29 09:43
S75	6	(US-20120201201-$ or US-20130176897-$ or US-20130150012-$ or US-20120230304-$ or US-20070060128-$ or US-20040264427-$).did.	US-PGPUB	OR	ON	2016/09/29 10:22
S76	6	previous$4 with connect$4 with (ap "access point") and S75	US-PGPUB; USPAT	OR	ON	2016/09/29 10:22
S77	62050	(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08).cpc.	US-PGPUB; USPAT	OR	ON	2016/09/29 11:07
S78	386	S72 and S77	US-PGPUB; USPAT	OR	ON	2016/09/29 11:08

3/5/2017 8:33:21 PM
C:\Users\chan\Documents\EAST\Workspaces\13885754.wsp

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

CPC								
Symbol							**Type**	**Version**
H04W		12	/	08			F	2013-01-01
H04W		8	/	26			I	2013-01-01
H04W		48	/	20			I	2013-01-01
H04W		12	/	06			I	2013-01-01
H04W		84	/	12			A	2013-01-01
H04W		88	/	08			A	2013-01-01
H04L		63	/	10			I	2013-01-01
			/					
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CPC Combination Sets									
Symbol							**Type**	**Set**	**Ranking**	**Version**
			/							
			/							

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	17	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	03/05/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

US ORIGINAL CLASSIFICATION		INTERNATIONAL CLASSIFICATION										
CLASS	SUBCLASS	CLAIMED					NON-CLAIMED					
		H	0	4	W	4 / 00 (2009.01.01)						
CROSS REFERENCE(S)												
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)											

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	17	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414	03/05/2017	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	3

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	**Art Unit**
	CLEMENCE HAN	2414

☒ **Claims renumbered in the same order as presented by applicant** ☐ **CPA** ☐ **T.D.** ☐ **R.1.47**

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original

NONE (Assistant Examiner)	(Date)	**Total Claims Allowed:** 17	
/CLEMENCE HAN/ Primary Examiner.Art Unit 2414 (Primary Examiner)	03/05/2017 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 3

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	13885754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

CPC- SEARCHED		
Symbol	Date	Examiner
H04W8/26,H04W48/20,H04W12/06,H04W84/12,H04W88/08	2/1/2015	ch
(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08).cpc.	9/29/2016	ch

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
370	338 text search only	10/20/2014	ch
726	2-4 text search only	10/20/2014	ch
455	410, 411 text search only	10/20/2014	ch
709	225, 229 text search only	10/20/2014	ch
380	247, 270 text search only	10/20/2014	ch
713	168 text search only	10/20/2014	ch

SEARCH NOTES		
Search Notes	Date	Examiner
inventor search	10/20/2014	ch
see Search History printout	10/20/2014	ch
see Search History printout	2/1/2015	ch
see Search History printout	8/7/2015	ch
see Search History printout	11/15/2015	ch
see Search History printout	4/16/2016	ch
(H04W12/08 or H04L63/10 or H04W12/06 or H04W48/20 or H04W8/26 or H04W84/12 or H04W88/08) see Search History printout	9/29/2016	ch
see Search History printout	9/29/2016	ch
see Search History printout	3/5/2017	ch

INTERFERENCE SEARCH			
US Class/ CPC Symbol	**US Subclass / CPC Group**	**Date**	**Examiner**
	see Interference Search printout	2/1/2015	ch
	see Interference Search printout	11/15/2015	ch
	see Interference Search printout	3/5/2017	ch

AFCP 2.0 Decision	Application No.	Applicant(s)
	13/885,754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

This is in response to the After Final Consideration Pilot request filed 02/21/2017.

1. **Improper Request** – The AFCP 2.0 request is improper for the following reason(s) and the after final amendment submitted with the request will be treated under pre-pilot procedure.

   ☐ An AFCP 2.0 request form PTO/SB/434 (or equivalent document) was not submitted.

   ☐ A non-broadening amendment to at least one independent claim was not submitted.

   ☐ A proper AFCP 2.0 request was submitted in response to the most recent final rejection.

   ☐ Other:

2. **Proper Request**

   A. After final amendment submitted with the request will not be treated under AFCP 2.0.
   The after final amendment cannot be reviewed and a search conducted within the guidelines of the pilot program.

   ☐ The after final amendment will be treated under pre-pilot procedure.

   B. Updated search and/or completed additional consideration.
   The examiner performed an updated search and/or completed additional consideration of the after final amendment within the time authorized for the pilot program. The result(s) of the updated search and/or completed additional consideration are:

   ☒ 1. All of the rejections in the most recent final Office action are overcome and a Notice of Allowance is issued herewith.

   ☐ 2. The after final amendment would not overcome all of the rejections in the most recent final Office action. See attached interview summary for further details.

   ☐ 3. The after final amendment was reviewed, and it raises a new issue(s). See attached interview summary for further details.

   ☐ 4. The after final amendment raises new issues, but would overcome all of the rejections in the most recent final Office action. A decision on determining allowability could not be made within the guidelines of the pilot. See attached interview summary for further details, including any newly discovered prior art.

   ☐ 5. Other:

   Examiner Note: Please attach an interview summary when necessary as described above.

EAST Search History

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L10	146	("probe request frame").clm.	USPAT	OR	ON	2017/03/05 19:40
S32	77	("probe request frame").clm.	USPAT	OR	ON	2015/04/10 11:10
S58	55	(fake with (address mac id identifier)).clm.	USPAT	OR	ON	2015/11/15 22:38
S59	89	("probe request frame").clm.	USPAT	OR	ON	2015/11/15 22:38

3/5/2017 8:33:43 PM
C:\Users\chan\Documents\EAST\Workspaces\13885754.wsp

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

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86636 7590 03/07/2017
BRUNDIDGE & STANGER, P.C.
2318 MILL ROAD, SUITE 1020
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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

TITLE OF INVENTION: SCHEMES FOR CONNECTING TO WIRELESS NETWORK

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	$960	$0	$960	$960	06/07/2017

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAN, CLEMENCE S	2414	370-338000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
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1 Brundidge & Stanger, P.C.
2
3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

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

(A) NAME OF ASSIGNEE: EMPIRE TECHNOLOGY DEVELOPMENT LLC

(B) RESIDENCE: (CITY and STATE OR COUNTRY): WILMINGTON, DE (US)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☑ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:
- ☑ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

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- ☑ Payment by credit card. Form PTO-2038 is attached.
- ☑ The director is hereby authorized to charge the required fee(s), any deficiency, or credits any overpayment, to Deposit Account Number 50-4888 (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)
- ☐ Applicant certifying micro entity status. See 37 CFR 1.29 — NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
- ☐ Applicant asserting small entity status. See 37 CFR 1.27 — NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
- ☐ Applicant changing to regular undiscounted fee status. — NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature /Daniel J. Stanger/ Date June 06, 2017

Typed or printed name Daniel J. Stanger Registration No. 32,846

PTOL-85 Part B (10-13) Approved for use through 10/31/2013. OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Electronic Patent Application Fee Transmittal

Application Number:	13885754
Filing Date:	16-May-2013
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Filer:	Daniel John Stanger
Attorney Docket Number:	2582.737BS

Filed as Large Entity

Filing Fees for U.S. National Stage under 35 USC 371

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
UTILITY APPL ISSUE FEE	1501	1	960	960

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Extension-of-Time:				
Miscellaneous:				
			Total in USD ($)	**960**

Electronic Acknowledgement Receipt

EFS ID:	29406939
Application Number:	13885754
International Application Number:	
Confirmation Number:	1482
Title of Invention:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK
First Named Inventor/Applicant Name:	Hyoung-Gon Lee
Customer Number:	86636
Filer:	Daniel John Stanger/Mariah Duell
Filer Authorized By:	Daniel John Stanger
Attorney Docket Number:	2582.737BS
Receipt Date:	06-JUN-2017
Filing Date:	16-MAY-2013
Time Stamp:	12:56:05
Application Type:	U.S. National Stage under 35 USC 371

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$960
RAM confirmation Number	060617INTEFSW13000000
Deposit Account	504888
Authorized User	Mariah Duell

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

37 CFR 1.17 (Patent application and reexamination processing fees)

37 CFR 1.19 (Document supply fees)

37 CFR 1.20 (Post Issuance fees)

37 CFR 1.21 (Miscellaneous fees and charges)

37 CFR 1.492 (National application filing, search, and examination fees)

37 CFR 1.492(a) (Basic national fee only)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Amendment after Notice of Allowance (Rule 312)	KR-839496-02-US-NAT_20170606_312AMD.pdf	62366 504efcf6f7a588641871dd9639ab586628e9363b	no	11
Warnings:					
Information:					
2	Issue Fee Payment (PTO-85B)	KR-839496-02-US-NAT_20170606_IssueFee_Transmittal.pdf	113212 0bb89af083ccda048373d689ca72b99f21eaaeb4	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30690 40d906b0f73f7007a4e13af19656478aae0723fd	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	206268		

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New Applications Under 35 U.S.C. 111

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

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

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

New International Application Filed with the USPTO as a Receiving Office

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

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Hyoung-Gon Lee	Examiner:	HAN, CLEMENCE S
Application No.:	13/885,754	Confirmation No:	1482
Filed:	May 16, 2013	Docket No.:	2582.737BS
Title:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK		

TRANSMITTAL AND AMENDMENT UNDER 37 C.F.R. § 1.312

Dear Sir:

This paper is responsive to the Notice of Allowance mailed on March 07, 2017. Please enter the following amendments:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims begin on page 5 of this paper.

Remarks begin on page 10 of this paper.

AMENDMENTS TO THE SPECIFICATION

The following will replace all prior versions of the listed paragraphs in the application (as filed). The amendment to the specification does not introduce any new matter.

Please amend the paragraph (as previously submitted on April 1, 2015), immediately following the title on page 1 of the specification, as follows:

CROSS-REFERENCE TO RELATED ~~APPLICATIONS~~APPLICATION

This Application is the U.S. National Stage filing under 35 U.S.C. § 371 of [[PCT]]International Application Ser. No. PCT/US12/66306, filed on November 21, 2012.

Please amend the paragraph [0021] of the specification, as filed, as shown below:

[0021] By way of example, access point 120 may include a Wi-Fi access point and provide a WLAN that includes a Wi-Fi network. Further, by way of example, end device 130 may include, but not exclusively, a personal communication terminal, such as PCS (Personal Communication System), [[GMS]]GSM (Global System for Mobile communications), PDC (Personal Digital Cellular), PHS (Personal Handyphone System), PDA (Personal Digital Assistant), IMT (International Mobile Telecommunication)-2000, CDMA (Code Division Multiple Access)-2000, W-CDMA (W-Code Division Multiple Access) and Wibro (Wireless Broadband) Internet[[)]] terminals.

Please amend the paragraph [0049] of the specification, as filed, as shown below:

[0049] In some implementations, signal bearing medium 502 may encompass a computer-readable medium 506, such as, but not limited to, a hard disk drive (HDD), a compact disk (CD), a digital versatile disk (DVD), a digital tape, memory, etc. In some implementations, signal bearing medium 502 may encompass a recordable medium 508, such as, but not limited to, memory, read/write (R/W) CDs, R/W DVDs, etc. In some implementations, signal bearing medium 502 may encompass a communications medium 510, such as, but not limited to, a digital and/or an analog communication medium (e.g., a fiber optic cable, a waveguide, a wired

~~communications~~ communication link, a wireless communication link, etc.). Thus, for example, computer program product 500 may be conveyed to one or more modules of mobile operating server 110 by an RF signal bearing medium 502, where the signal bearing medium 502 is conveyed by a wireless communications medium 510 (e.g., a wireless communications medium conforming with the IEEE 802.11 standard).

Please amend the paragraph [0051] of the specification, as filed, as shown below:

[0051] Depending on the desired configuration, processor 604 may be of any type including but not limited to a microprocessor (μP), a microcontroller (μC), a digital signal processor (DSP), or any combination thereof. Processor 604 may include one or more levels of caching, such as a level one cache 610 and a level two cache 612, a processor core 614, and registers 616. An example processor core 614 may include an arithmetic logic unit (ALU), a floating point unit (FPU), a digital signal processing core (DSP [[Core]]core), or any combination thereof. An example memory controller 618 may also be used with processor 604, or in some implementations memory controller 618 may be an internal part of processor 604.

Please amend the paragraph [0060] of the specification, as filed, as shown below:

[0060] It will be understood by those within the art that, in general, terms used herein, and especially in the appended claims (e.g., bodies of the appended claims) are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.). It will be further understood by those within the art that if a specific number of an introduced claim recitation is intended, such an intent will be explicitly recited in the claim, and in the absence of such recitation, no such intent is present. For example, as an aid to understanding, the following appended claims may contain usage of the introductory phrases "at least one" and "one or more" to introduce claim recitations. However, the use of such phrases should not be construed to imply that the introduction of a claim recitation by the indefinite articles "a" or "an" limits any particular claim

containing such introduced claim recitation to embodiments containing only one such recitation, even when the same claim includes the introductory phrases "one or more" or "at least one" and indefinite articles such as "a" or "an" (e.g., "a" and/or "an" should be interpreted to mean "at least one" or "one or more"); the same holds true for the use of definite articles used to introduce claim recitations. In addition, even if a specific number of an introduced claim recitation is explicitly recited, those skilled in the art will recognize that such recitation should be interpreted to mean at least the recited number (e.g., the bare recitation of "two recitations," without other modifiers, means at least two recitations, or two or more recitations). Furthermore, in those instances where a convention analogous to "at least one of A, B, and C, etc." is used, in general, such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a system having at least one of A, B, and C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). In those instances where a convention analogous to "at least one of A, B, or C, etc." is used, in general, such a construction is intended in the sense one having skill in the art would understand the convention (e.g., "a system having at least one of A, B, or C" would include but not be limited to systems that have A alone, B alone, C alone, A and B together, A and C together, B and C together, and/or A, B, and C together, etc.). It will be further understood by those within the art that virtually any disjunctive word and/or phrase presenting two or more alternative terms, whether in the description, claims, or drawings, should be understood to contemplate the possibilities of including one of the terms, either of the terms, or both terms. For example, the phrase "A or B" will be understood to include the possibilities of "A" or "B" or "A and B."

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A method performed under control of an end device, the method comprising:

receiving a fake device identifier from a mobile operating server;

transmitting, to an access point, a probe request frame that includes the fake device identifier for the end device;

receiving, from the access point, a probe response frame that includes information regarding the access point;

determining that the access point is an authenticated access point based, at least in part, on the information in the probe response frame that indicates that:

the access point is controlled by the mobile operating server, and

the access point was connected with the end device previous to when the access point received the transmitted probe request frame; and

transmitting, to the access point determined to be the authenticated access point, a connection request that includes an authentic device identifier for the end device.

2. (Original) The method of Claim 1, further comprising:

receiving, from the access point, an approval of the connection request; and

connecting to a wireless local area network provided by the access point.

3. (Original) The method of Claim 2, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

4-6. (Canceled)

7. (Previously Presented) The method of Claim 1, wherein the receiving the fake device identifier includes receiving at least one of a random number or a random character.

8. (Original) The method of Claim 1, wherein the authentic device identifier includes a media access control (MAC) address.

9. (Currently Amended) The method of Claim 1, further comprising:

receiving, from the mobile operating server, an authenticated access point list ~~including~~ that includes information regarding at least one authenticated access point,

wherein the determining is further based, at least in part, on the authenticated access point list.

10. (Original) The method of Claim 9, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

11. (Currently Amended) An end device, comprising:

a transmitter configured to transmit, to an access point, a probe request frame that includes a fake device identifier;

a receiver configured to receive, from the access point, a probe response frame that includes information regarding the access point;

a memory configured to store an authenticated access point list ~~including~~ that includes information regarding at least one authenticated access point;

a determination unit configured to determine that the access point is the at least one authenticated access point based, at least in part, on the information regarding the access point that indicates that:

the access point is controlled by a mobile operating server, and

the access point was connected with the end device previous to when the access point received the probe request frame transmitted from the transmitter; and

a connection unit configured to connect to a wireless local area network provided by the access point,

wherein the receiver is further configured to receive the fake device identifier from the mobile operating server,

wherein the transmitter is further configured to transmit, to the access point, a connection request that includes an authentic device identifier, and

wherein the receiver is further configured to receive, from the access point, an approval of the connection request.

12-13. (Canceled)

14. (Original) The end device of Claim 11, wherein the fake device identifier includes at least one of a random number or a random character.

15. (Original) The end device of Claim 11, wherein the authentic device identifier includes a media access control (MAC) address.

16. (Currently Amended) The end device of Claim 11, wherein the determination unit is further configured to determine that the access point is the at least one authenticated access point based, at least in part, on the information regarding the access point that is included in the authenticated access point list.

17. (Original) The end device of Claim 11, wherein the information regarding the at least one authenticated access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) for each of the at least one authenticated access point, and

wherein the information regarding the access point includes at least one of a media access control (MAC) address or a service set identifier (SSID) of the access point.

18. (Original) The end device of Claim 11, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

19. (Canceled)

20. (Currently Amended) A non-transitory computer-readable storage medium having stored thereon computer-executable instructions that, in response to execution, cause an end device to perform or control performance of operations that comprise:

obtain a fake device identifier from a mobile operating server;

transmit, to an access point, a probe request frame that includes the fake device identifier for the end device;

obtain, from the access point, a probe response frame that includes information regarding the access point;

determine that the access point is an authenticated access point based, at least in part, on the information in the probe response frame that indicates that:

the access point is controlled by the mobile operating server, and

the access point was connected with the end device previous to when the access point received the transmitted probe request frame; and

transmit, to the access point determined to be the authenticated access point, a connection request that includes an authentic device identifier of the end device.

21. (Previously Presented) The non-transitory computer-readable storage medium of Claim 20, wherein the operations further comprise:

obtain, from the access point, an approval of the connection request; and

connect to a wireless local area network provided by the access point.

22. (Canceled)

23. (Previously Presented) The non-transitory computer-readable storage medium of Claim 20, wherein the authentic device identifier includes a media access control (MAC) address.

24. (Currently Amended) The non-transitory computer-readable storage medium of Claim [[20]]21, wherein the access point includes a Wi-Fi access point, and the wireless local area network provided by the access point includes a Wi-Fi network.

25. (Canceled)

REMARKS

The present amendments are submitted after the Notice of Allowance in accordance with 37 CFR § 1.312.

Amendments to the Specification

The specification is amended at paragraphs [0021], [0049], [0051], and [0060] to correct for minor typographical errors identified during review of the application. The specification is also amended to update/revise the Cross-Reference to Related Application section. By entry of this amendment, the specification is made consistent with the other papers that are of record in the file wrapper of the present application. Entry of the amendments to the specification is respectfully requested.

Amendments to the Claims

Claims 1, 9, 11, 16, 20, and 24 have been amended to correct for minor informalities identified during review of the application and/or to otherwise place such claims in better form. Entry of the amendments to claims 1, 9, 11, 16, 20, and 24 is respectfully requested.

Remarks in Response to Reasons for Allowance

Examiner's statements of Reasons for Allowance of the above-referenced patent application are acknowledged and it is agreed that the claimed subject matter is patentable. However, no position is taken regarding the Reasons for Allowance presented by the Examiner other than the positions that may have previously been taken during prosecution. Therefore, the Examiner's Reasons for Allowance should not be attributed as being an indication of the basis for the belief that the claims are patentable. Furthermore, it is respectfully asserted that there may also be additional reasons for patentability of the claimed subject matter not explicitly stated in this record and no waiver of rights are made to such arguments by not further addressing such reasons herein.

Conclusion

In view of the foregoing amendments, it is respectfully requested that the amendments made to the present application be entered prior to patent issue, as allowed by 37 C.F.R. § 1.312. If the Examiner has any questions or comments concerning this matter, the Examiner is invited to contact the undersigned attorney at the number below.

Respectfully submitted,

Brundidge & Stanger, P.C.

Dated: June 6, 2017

By: /Daniel J. Stanger/
Daniel J. Stanger
Reg. No.: 32,846

UNITED STATES PATENT AND TRADEMARK OFFICE

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	05/16/2013	Hyoung-Gon Lee	2582.737BS	1482

86636 7590 06/12/2017
BRUNDIDGE & STANGER, P.C.
1925 BALLENGER AVENUE, STE. 560
ALEXANDRIA, VA 22314

EXAMINER
HAN, CLEMENCE S

ART UNIT	PAPER NUMBER
2414	

MAIL DATE	DELIVERY MODE
06/12/2017	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Rule 312 Communication	Application No.	Applicant(s)
	13/885,754	LEE, HYOUNG-GON
	Examiner	Art Unit
	CLEMENCE HAN	2414

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

1. ☒ The amendment filed on *6/06/2017* under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

/CLEMENCE HAN/
Primary Examiner, Art Unit 2414

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s):	Hyoung-Gon Lee	Examiner:	HAN, CLEMENCE S
Application No.:	13/885,754	Confirmation No:	1482
Filed:	May 16, 2013	Docket No.:	2582.737BS
Title:	SCHEMES FOR CONNECTING TO WIRELESS NETWORK		

TRANSMITTAL AND AMENDMENT UNDER 37 C.F.R. § 1.312

OK TO ENTER: /C.S.H/

Dear Sir:

This paper is responsive to the Notice of Allowance mailed on March 07, 2017. Please enter the following amendments:

Amendments to the Specification begin on page 2 of this paper.

Amendments to the Claims begin on page 5 of this paper.

Remarks begin on page 10 of this paper.

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/885,754	07/25/2017	9717005	2582.737BS	1482

86636 7590 07/03/2017

BRUNDIDGE & STANGER, P.C.
1925 BALLENGER AVENUE, STE. 560
ALEXANDRIA, VA 22314

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 492 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

EMPIRE TECHNOLOGY DEVELOPMENT LLC, Wilmington, DE;
Hyoung-Gon Lee, Seoul, KOREA, REPUBLIC OF;

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