

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONOS, INC.,
Petitioner,

v.

GOOGLE LLC,
Patent Owner.

U.S. Patent No. 11,050,615
Original Issue Date: June 29, 2021
Title: APPARATUS AND METHOD FOR SEAMLESS
COMMISSIONING OF WIRELESS DEVICES

Case No. IPR2023-00806

**SONOS, INC.'S PETITION FOR *INTER PARTES*
REVIEW OF U.S. PATENT NO. 11,050,615**

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LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,050,615 to Mathews et al.
1002	File History of U.S. Patent No. 11,050,615 to Mathews et al.
1003	Declaration of Douglas C. Schmidt, Ph.D.
1004	U.S. Patent No. 7,616,594 to Roberts et al.
1005	U.S. Patent No. 9,288,228 to Suumäki
1006	U.S. 2006/0251256 A1 to Asokan et al.
1007	Excerpt from <u>Microsoft Computer Dictionary</u> , 5 th Ed. (2002)
1008	NFC Forum, NFC Data Exchange Format (NDEF), Technical Specification, NDEF 1.0 (July 24, 2006)
1009	U.S. Patent No. 7,738,494 to Takayama
1010	U.S. Patent No. 7,948,925 to Miyabayashi et al.
1011	U.S. Pub. 2013/0010018 A1 to Economy
1012	ISO/IEC 18092 Standard (April 1, 2004)
1013	U.S. Patent No. 8,975,752 to Chow et al.
1014	File History of U.S. App. No. 13/839,828
1015	File History of U.S. App. No. 14/927,406
1016	Order Granting Motion for Stay from <i>Google LLC v. Sonos, Inc.</i> , Case No. 22-cv-04553-JST (N.D. Cal.)
1017	U.S. Patent No. 7,751,513 to Eisenhut et al.
1018	U.S. Patent No. 7,747,751 to Chen
1019	Specification of the Bluetooth System, Ver. 4.0 (June 30, 2010)

1020	NFC Forum, Connection Handover Technical Specification (July 7, 2010)
1021	NFC Forum, Logical Link Control Protocol (Dec. 11, 2009)

I. Introduction

Petitioner Sonos, Inc. (“Sonos” or “Petitioner”) respectfully requests IPR of claims 1-3, 5-12, and 15-19 of U.S. Patent No. 11,050,615 (“the ’615 patent”), which is assigned to Google LLC (“Google” or “Patent Owner”). There is more than a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim.

The ’615 patent is directed to systems and methods for “commissioning” a new device onto an existing wireless network. This commissioning process entails providing the device with the information it needs—like the network’s name and security key—to communicate over the network. The patent characterizes prior art commissioning systems as overly complicated and not user-friendly, and often requiring users to manually enter network details or have administrative access.

The ’615 patent purports to improve on the prior art by allowing a device that is already on the network—which the patent calls a “smart wireless device”—to transmit network configuration information to a device that wants to join the network. A short-range, “side band” method of communication such as Bluetooth, near field communication (NFC), RF identification (RFID), or light transmission that is independent of the network to be joined is used for this transmission. The device joining the network uses the configuration information it receives via Bluetooth, NFC, or the other independent means of communication to join the

wireless network.

As of the '615 patent's filing date, using a "side band" method of communication like Bluetooth or NFC to send network confirmation information to device that wanted to join a wireless network was well known. This petition discusses three prior art references that disclose this concept: (1) U.S. Patent No. 7,616,594 to Roberts et al. (Ex. 1004, "Roberts"), (2) U.S. 2006/0251256 A1 to Asokan et al. (Ex. 1006, "Asokan"), and (3) U.S. Patent No. 9,288,228 to Suumäki (Ex. 1005, "Suumäki").

Roberts, like the '615 patent, is directed to a simple, user-friendly system for commissioning a new device onto an existing wireless network. Rather than requiring manual entry of information or other complicated procedures, Roberts teaches that an existing device on the network (a "registrar") transmits network configuration information to a new device (an "enrollee"). Roberts teaches virtually everything the '615 patent's claims require. While it does not explicitly reference the presence of certain well-known hardware components—like a wireless radio—it does disclose the use of wireless networks and a person having ordinary skill in the art (a "POSITA") would therefore have understood that using conventional networking hardware elements would have been obvious.

Roberts also explains that either the wireless network itself or a separate "out of band" communication channel (such as Bluetooth) may be used when sending the

network configuration information to an enrollee. Given that Roberts teaches that Bluetooth is one communication method its system can employ, a POSITA would have considered it obvious and have been motivated to use it when implementing Roberts. Roberts does, however, disclose *multiple* potential ways to transmit the network configuration information to an enrollee. Other prior art—including Asokan—shows that a POSITA would have had good reason to select an out-of-band communication method like Bluetooth. Asokan also discloses the limitations required by certain of the '615 patent's dependent claims.

Like Roberts, Asokan relates to a system for configuring a new device to communicate on an existing wireless network. Asokan employs an “out-of-band channel,” like Bluetooth, NFC, or RFID, whenever possible when sending network configuration information. According to Asokan, using such an “out-of-band channel” instead of the wireless network simplifies the process, improves security, and allows for better guest management. As explained in Ground 1, following Asokan's teachings and using an out-of-band channel when implementing Roberts renders claims 1-3, 5-12, and 15-19 obvious.

Suumäki provides the basis for this Petition's second obviousness ground. Suumäki also teaches commissioning a new device onto an existing wireless network in a user-friendly way. Suumäki employs an “out-of-band” NFC channel to provide required network configuration information. Thus, to initiate the

commissioning process, a user physically taps a device they want to add to the network to a device that is already on the network. This creates an NFC communication link and results in the transmission of network configuration information to the new device. Although Suumäki teaches everything in the challenged claims of the '615 patent, it is presented as an obviousness ground in this petition for two reasons: (i) because the petition references different embodiments of Suumäki and (ii) because Suumäki directs a POSITA to various industry standards to supplement its own teachings. These standards include additional disclosure pertinent to the claims here, including, for instance, teachings regarding the packet structure Suumäki would have been understood to employ. As explained in Ground 2, Suumäki's teachings render obvious claims 1-3, 5-12, and 15-19.

II. Mandatory Notices

A. Real Party-in-Interest

Petitioner Sonos is the real party-in-interest.

B. Related Matters

Google is asserting the '615 patent against Sonos in *Certain Audio Players and Components Thereof II*, Inv. No. 337-TA-1330 (U.S. ITC) and *Google LLC v. Sonos, Inc.*, Case No. 22-cv-04553-JST (N.D. Cal.) The District Court action is currently stayed pending resolution of the ITC investigation. (*See* Ex. 1016.)

C. Counsel, Service, and Fee Information

Petitioner designates the following counsel:

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Petitioner consents to service by electronic mail at the following addresses: P52PTABDocket@orrick.com and A8CPTABDocket@orrick.com. Petitioner's Power of Attorney is attached.

The USPTO is authorized to charge the filing fee and any other fees incurred by Petitioner to the deposit account of Orrick, Herrington, & Sutcliffe LLP: 15-0665.

III. Requirements for IPR

A. Grounds for Standing

Petitioner certifies that the '615 patent is available for IPR, and that Petitioner is not barred or estopped from requesting this IPR.

B. Identification of Challenge and Statement of Precise Relief Requested

Petitioner requests IPR of claims 1-3, 5-12, and 15-19. This petition discusses claim construction, explains why the claims are unpatentable, provides details regarding where the various claim limitations are found in the prior art, and is

supported by the accompanying Declaration of Douglas C. Schmidt, Ph.D. (Ex. 1003), a leading expert in the networking field.

The application underlying the '615 patent—U.S. App. 16/708,189—was filed December 9, 2019. Further, the patent makes a facial claim of priority back through a chain of continuation applications to U.S. App. 13/839,828, filed March 15, 2013, and provisional application No. 61/622,620, filed April 11, 2012. (Ex. 1001, Cover.) For purposes of this petition only, it has been assumed that the claims of the '615 patent are entitled to the benefit of this April 2012 provisional filing date.

Petitioner relies on the following references: (1) Roberts (Ex. 1004), (2) Suumäki (Ex. 1005), and (3) Asokan (Ex. 1006). These references are all prior art. (*See* Section VII.)

Petitioner challenges the claims on the following grounds:

Ground 1: Claims 1-3, 5-12, and 15-19 are obvious over Roberts and Asokan.

Ground 2: Claims 1-3, 5-12, and 15-19 are obvious over Suumäki.

IV. Institution Should Be Granted

Petitioner has established a reasonable likelihood of success on the merits and all other requirements for IPR have been met. The Board should institute IPR.

A. There Are No Grounds for a § 314 Discretionary Denial

There are two pending actions relating to the '615 patent: an ITC proceeding and a stayed district court action. In appropriate circumstances, the Board may

consider the factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019 Paper 11, (PTAB Mar. 20, 2020) (“*Fintiv*”) when determining whether institution should be granted when other actions are pending. But the Board has explained that “[t]he plain language of the *Fintiv* factors is directed to district court litigation and does not apply to ... ITC proceedings.” 6/21/22 Interim Procedure for Discretionary Denials, pp. 2-3. And, with respect to co-pending district court actions, “the PTAB will not rely on the *Fintiv* factors to ... deny institution ... where a petition presents compelling evidence of unpatentability.” *Id.*, p. 2. In other words, “compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel.” *Id.*, pp. 4-5.

Petitioner submits that institution is appropriate. The co-pending ITC action has no bearing on the Board’s decision to institute. And, while there is a district court action, it is stayed pending resolution of the ITC action. Thus, no trial has been scheduled, no claim construction has occurred, no dispositive motions have been filed, and no discovery has been conducted. (*See generally* Ex. 1016.) Moreover, as explained below, the claims of the ’615 patent are plainly and unambiguously unpatentable in view of the prior art.

B. Denial Under § 325(d) Would Be Inappropriate

The arguments set forth in this petition are different from those addressed by the Patent Office during prosecution. Roberts, Asokan, and Suumäki were not cited

by the applicant nor considered by the Examiner. (*See generally* Ex. 1002.) And, as explained in Section V.B below, the prior art references that were addressed by the Examiner purportedly failed to teach the claimed “target device” with a “microprocessor” that receives WLAN configuration “packets.” In contrast, both Roberts and Suumäki specifically teach this device. Thus, Roberts and Suumäki are substantively different from and overcome any purported deficiencies identified in connection with the art considered by the Examiner. For these reasons, and as further explained below, the Board should institute IPR.

V. The ’615 Patent

A. Overview

The ’615 patent relates to the “seamless commissioning of electronic devices onto wireless local area networks (WLANs).” (Ex. 1001, 1:37-40.) The patent explains that “wireless electronic devices do not merely connect themselves to the nearest wireless network.” (*Id.*, 1:62-64.) “Rather, they must be ‘commissioned’” or “provided with configuration data to enable them to join” the network. (*Id.*, 1:65-2:2.) The ’615 patent alleges that “virtually every electronic device is different in the manner in which they are commissioned onto a wireless network....” (*Id.*, 2:3-5.) This can entail a complicated “sequence of switch actuations,” “rudimentary keypads” requiring “cryptic and unintelligible” entries, or separate “coupled device[s]” like “remote controls” that are used “to enter network names and

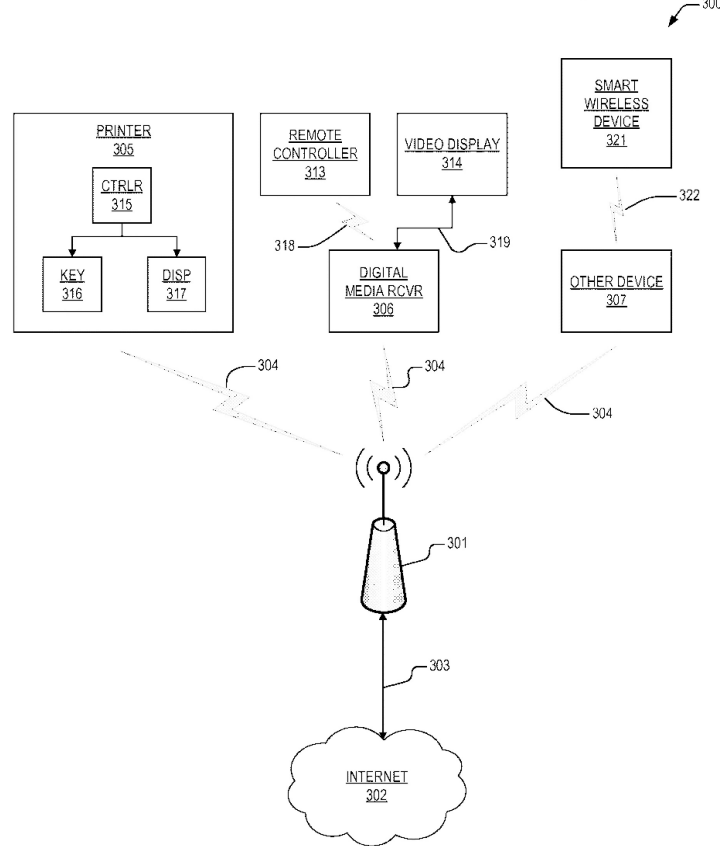
passwords.” (*Id.*, 2:5-14.) “[P]hysical or administrative access to ... the access point” is often also required. (*Id.*, 6:35-39.) This is problematic, according to the patent, because it necessitates the device user to “either be very smart,” or seek “assistance from someone who is knowledgeable.” (*Id.*, 2:13-16.)

The ’615 patent seeks to provid[e] “a superior technique for commissioning ... devices onto an existing wireless network” that “an average consumer can employ....” (*Id.*, 2:17-19, 29-33.) The patent employs a “smart wireless device” with a “transducer” that can transmit “WLAN configuration packets” to a “target device” to allow that device to “join a WLAN.” (*Id.*, 2:43-64.)

Figure 3 shows an “access point 301 that controls access to and communication” to a “WLAN 304.” (*Id.*, 7:3-8.) A “printer 305 and a digital media receiver 306” are “coupled to the access point 301 via the WLAN 304.” (*Id.*, 7:25-27.) “[A]nother device 307 ... is not yet coupled to the access point via the WLAN 304, and ... requires commissioning....” (*Id.*, 7:28-30.) A “smart wireless device 321” is also part of the network and is employed to “commission the other device 307.” (*Id.*, 7:49-55.)

FIG. 3

EXEMPLARY SEAMLESS DEVICE COMMISSIONING TECHNIQUE

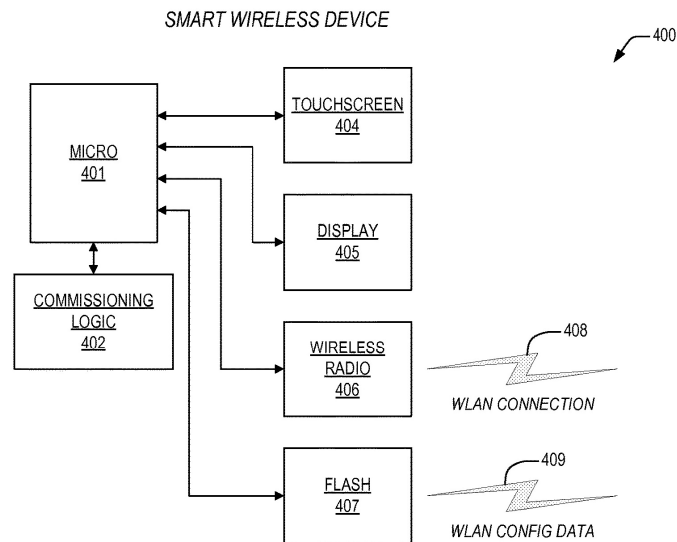


(Id., Fig. 3.)

As shown in Figure 4, the “smart wireless device” includes a “microcomputer 401” “coupled to commissioning logic 402” and a “touchscreen 404” / “display 405.” (*Id.*, 9:7-10.) The device has a “wireless radio 406” that allows it to participate in and communicate via the “WLAN 408.” (*Id.*, 9:10-15, 44-47.) It also “utilizes a side band, proximity based, communication channel 322 that is established between the smart wireless device 321 and the other device 307 to be commissioned onto the WLAN 304.” (*Id.*, 8:9-13.) This can be a “camera flash,” light emitted by the “display backlight,” or a transmitter that utilizes “BLUETOOTH®[,]” “near field

communications (NFC)[,]” “mechanical vibration/accelerometer transmission[,]” “RF identification (ID), ... Zigbee®, radio frequency for consumer electronics (RF4CE®), Z-Wave®, or other proprietary standards.” (*Id.*, 8:42-67.) Regardless of its form, the “transmitting element” employs “well-known communication protocols, error correcting codes, line coding, and/or modulation techniques.” (*Id.*, 10:1-6.) In the example of Figure 4, the “smart wireless device” uses “camera flash 407” to “convey configuration data” 409 “to the device to be commissioned.” (*Id.*, 9:13-15.)

FIG. 4

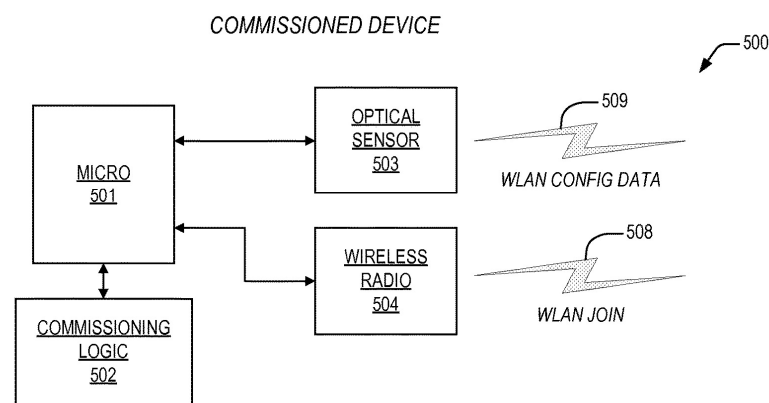


(*Id.*, Fig. 4.) “[T]he WLAN configuration data” can include “the name of the WLAN, security mode, and any required security passphrase.” (*Id.*, 8:32-37.)

Figure 5 shows the device 307 to be “commissioned” onto the network. (*Id.*, 10:7-11.) This device also has a “microcontroller 501” and “wireless radio 504.”

(*Id.*, 10:11-14.) It includes a “receiving element[]” that allows it to receive the configuration data transmitted by the smart device 321. (*Id.*, 7:55-59.) In figure 5 this is an “optical sensor 503” that receives the “WLAN configuration data” transmitted by the smart device’s flash over “optical transmission link 509.” (*Id.*, 10:13-17.)

FIG. 5



(*Id.*, Fig. 5.)

“In operation, the other device 307 extracts the WLAN configuration data from the received configuration message and employs the configuration data in order to join the WLAN 304.” (*Id.*, 8:38-41; *see also* Ex. 1003, ¶¶ 44-68.)

B. Prosecution History

The '615 patent was filed December 9, 2019 as U.S. application 16/708,189. (*See* Ex. 1001, Cover.) During prosecution, the claims were subject to a double patenting rejection over U.S. Patent Nos. 9,485,790 and 9,198,204. (*See* Ex. 1002, pp. 88-93.) The Examiner also referenced U.S. Apps. 2013/0026947 to Economy

et al. and 2013/0223279 to Tinnakornsriruphap et al. (*Id.*, p. 93.) In earlier applications, the applicant had argued that Economy—which is directed to a system for adding a light dimmer switch to a network—does not equip a “target device” with a “microcontroller or instructions” to “‘decode and process WLAN configuration packets’ as claimed.” (Ex. 1014, pp. 174-175.) Further, while Economy does transmit network configuration data to the dimmer switch, it purportedly does not employ “WLAN configuration packets ... received at the first wireless radio.” (Ex. 1015, pp. 145-146.) The Examiner similarly characterized Economy as teaching a “wireless control device” that “exchanges information with [a] dimmer switch in order for the dimmer switch to connect with [a] wireless router.” (Ex. 1002, p. 93.) The Examiner went on to note that “Tinnakornsriruphap” “teaches the use of a mobile device,” “a smart appliance” with a processor, “and a WLAN access point....” (*Id.*, p. 94.) But, the Examiner characterized “the structure of the dimmer switch of Economy and the smart appliance of Tinnakornsriruphap” as “fundamentally different” such that it would not have been obvious to employ the processor-containing smart appliances of Tinnakornsriruphap with Economy. (*Id.*) The ’615 patent’s claims were allowed after a terminal disclaimer was filed. (*See id.*, pp. 168-174; *see also* Ex. 1003, ¶¶ 69-77.)

VI. Claim Construction

The Board applies the same *Phillips* claim construction standard used by district courts. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (*en banc*). For purposes of this petition, Petitioner submits that the terms of the '615 patent's claims do not require further construction and can be afforded their plain and ordinary meaning. (See Ex. 1003, ¶¶ 79-82.)

VII. Prior Art Overview

A. Roberts

Roberts issued November 10, 2009. (See Ex. 1004, Cover.) It is prior art under § 102(b). Roberts is not cited by the '615 patent and was not considered during prosecution. (See *generally* Exs. 1001, 1002.)

Roberts relates to a system for “establishing communication with a wireless network.” (Ex. 1004, 1:12-14.) Before joining such a network, a “device needs Wi-Fi specific settings, such as a service set identifier (SSID), a cryptographic key, and operating channels.” (*Id.*, 1:29-32.) But existing methods for “[c]onfiguring a device” are “difficult.” (*Id.*, 1:26-29.) For instance, a user must often “manually enter the configuration in the device, which can be a very confusing process.” (*Id.*, 1:32-35.)

To address this problem, Roberts teaches a system in which a new “enrollee device” is automatically provided with the “necessary configuration settings” by a

“registrar” device that “is already connected to the network.” (Ex. 1004, 1:47-55.)

This is shown in Figure 5:

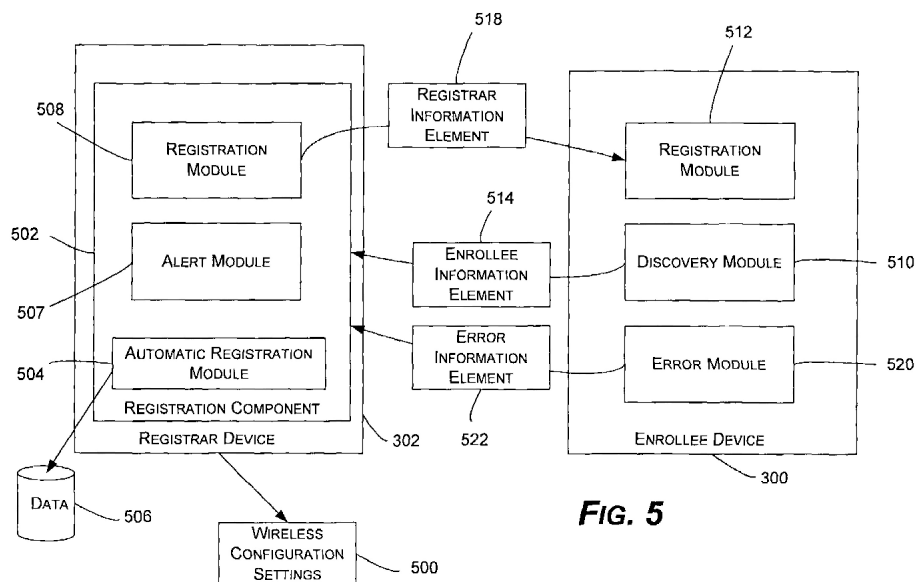


FIG. 5

(*Id.*, Fig. 5.) An “enrollee device 300” transmits an “enrollee information element 514.” (*Id.*, 5:44-53.) In response, a communication channel is established, and a “registrar device 302” on the wireless network transmit back a “registrar information element 518” over this channel. (*Id.*, 2:6-10; 7:43-52; 9:17-20, 42-45; 11:18-21, 33-40, 62-65; 12:1-6.; Figs. 5, 6.) Either an “in band” or “out of band” communication channel such as Bluetooth can be employed. (*Id.*, Abstract; 1:66-2:19; 6:26-28; 7:43-52.) The “element 518” includes the network configuration information—the network SSID and key—the enrollee device needs to join the network. (*See id.*, 7:30-42; Fig. 8; *see also* Ex. 1003, ¶¶ 85-96.)

B. Asokan

Asokan published November 9, 2006. (Ex. 1006, Cover.) It is prior art under § 102(b). Asokan is not cited by the '615 patent and was not considered during prosecution. (*See generally* Exs. 1001, 1002.)

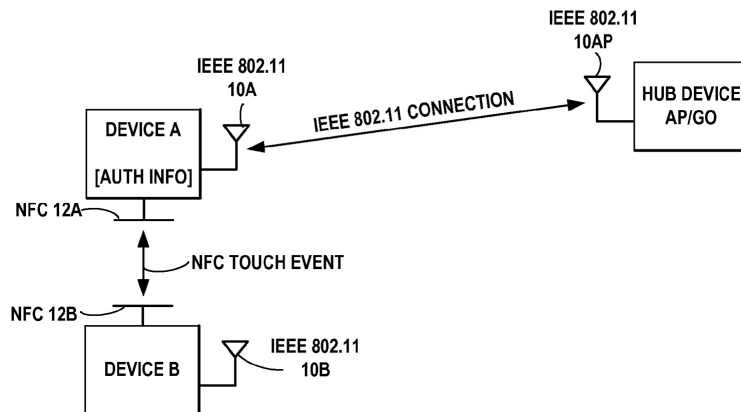
Asokan teaches “[m]ethods and systems for managing access to a wireless local area network” by new or guest devices. (Ex. 1006, Abstract; ¶ [0002].) Rather than using the same method of communication employed by the existing wireless network to transmit configuration information to a new device, Asokan explains that its system “utilizes an out-of-band channel ... to communicate authentication key and network address information to” that device. (*Id.*, ¶ [0010].) The employed out-of-band channel can be based on “NFC, short range wireless communication, infrared, Bluetooth, UWB, WiFi, RFID, USB memory stick, etc.” (*Id.*) According to Asokan, use of an out-of-band channel—and not the in-band channel—for network commissioning allows for “simpler and more efficient wireless network setup and administration” and “provides for an increase to security and usability....” (*Id.*, ¶¶ [0008], [0010], [0025]; Abstract; *see also* Ex. 1003, ¶¶ 97-101.)

C. Suumäki

Suumäki was filed August 5, 2011. (*See* Ex. 1005, Cover.) It is § 102(e) art to the '615 patent. Suumäki is not cited by the '615 patent and was not considered during prosecution. (*See generally* Exs. 1001, 1002.)

Suumäki teaches a system and method for network “setup ... using an out-of-band carrier” such as “near-field communication.” (Ex. 1005, 1:9-11, 52-51; *see also id.*, 2:7-10.) This allows a new device to be commissioned with only a “simple wave or touch.” (*Id.*, 1:65-2:3.)

In one example, Suumäki discusses an existing “IEEE 802.11 in-band” “WLAN network” including a “device A” and a “hub device” or “access point” “AP/GO.” (*Id.*, 7:28-35; *see also id.*, 20:65-21:3.) Suumäki’s system operates to commission another device—“device B”—onto this network. (*See id.*, 7:20-8:9.) To do so, “the user of device A” “touch[es] the NFC transponder of device A to the NFC transponder of device B in order to initiate a short-range carrier transport switch procedure with device B.” (*Id.*, 21:37-44.) This is shown in Figure 1D below:



(*Id.*, Fig. 1D.) “[A]uthentication information 25 and connection information, such as the MAC address 26 of the hub device AP/GO” is then transmitted from device A to device B. (*Id.*, 21:52-59.) Upon receipt of the transmission, device B extracts

the network authentication and connection information it contains and uses it to communicate with the hub over the wireless network to complete the network configuration process. (*See id.*, 22:1-13; *see also id.*, 27:17-21; Fig. 1G.) This allows the new device to be “automatically connect[ed] to the hub device AP/GO” and the network it manages “without requiring the user to type in a PIN number.” (*Id.*, 21:32-37; *see also* Ex. 1003, ¶¶ 102-112.)

VIII. Level of Ordinary Skill in the Art

A POSITA in the technology field of the '615 patent would have had a degree in computer engineering, computer science, or a similar discipline, along with 2 years of professional experience in the fields of networking and network-based systems or applications, or an equivalent level of skill, knowledge, and experience. (Ex. 1003, ¶¶ 37-39.) This POSITA would be aware of and generally knowledgeable about how devices were provisioned onto wireless networks, along with standards applicable to well-known methods for communication such as Wi-Fi, Bluetooth, and NFC available at the time the '615 patent was filed. (*Id.*, ¶ 39.)

IX. Ground 1: Claims 1-3, 5-12, and 15-19 Are Obvious Over Roberts and Asokan

The combination of Roberts (Ex. 1004) and Asokan (Ex. 1006), when considered in view of the knowledge of a POSITA, renders claims 1-3, 5-12, and 15-19 obvious.

Roberts teaches a system where an existing device on a wireless network transmits network configuration information to a new device. The information allows the new device to join the network. Roberts explains that a variety of methods can be employed to transmit this information, including an out-of-band Bluetooth channel. Thus, Roberts teaches, and motivates the use of, a communication path that is independent of the wireless network. While Roberts does teach other methods of transmitting network configuration information, a POSITA would have had good reason to employ an out-of-band channel. Not only is this one of the methods Roberts itself references, but Asokan teaches that use of a separate “out-of-band” transmission method such as NFC, RFID, or Bluetooth is preferable when commissioning a new network device.

A. Claim-By-Claim Analysis

1. Claims 1, 11, 16

Claims 1, 11, and 16 are all independent. These claims embrace the same, basic subject matter. The only difference is that claim 1 is directed to a “method.” Claim 11 is directed to a “target device.” And, claim 16 is directed to “non-transitory computer readable storage medium.” Because of their similarity, this petition will discuss the claims together.

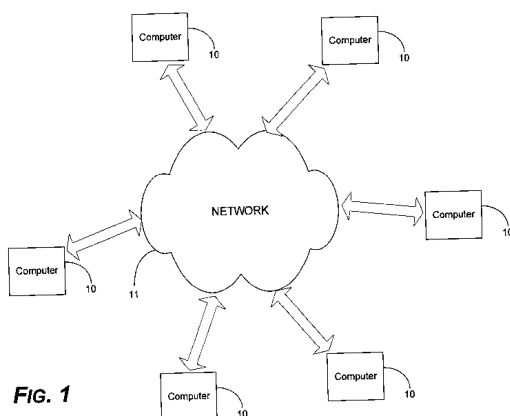
[1-p] “1. A method for commissioning a target device onto a communication network, comprising:”

[11-p] “11. A target device, comprising:”

[16-p] “16. A non-transitory computer readable storage medium storing one or more programs configured for execution by a target device for commissioning the target device onto a communication network,”

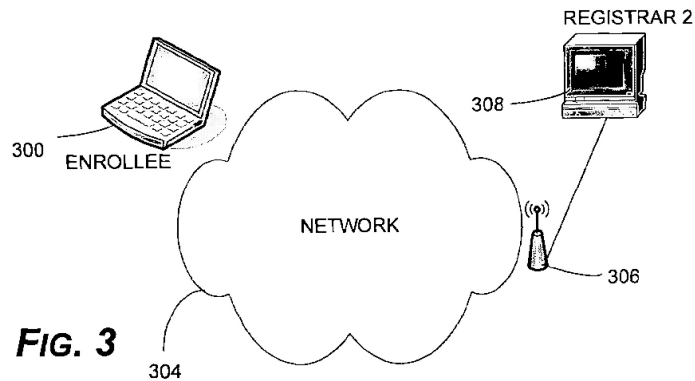
To the extent the preambles are limiting, they are taught by Roberts. Roberts relates to a system for “establishing communication with a wireless network.” (Ex. 1004, 1:12-14.) “A wireless device that desires to be connected to a wireless network” (“an ‘enrollee’ device”) “is ... provide[d] ... with necessary configuration settings” “by a device ... already connected to the network” (“a ‘registrar’ device”). (*Id.*, 1:47-55.) Stored programs or instructions are executed to control this process. (*Id.*, 3:15-16, 57-60.)

Figure 1 shows one such “network 11.” (*Id.*, 3:34-40.) The network may be an 802.11-based “Wi-Fi Network.” (*Id.*, 1:27-29, 60-65; *see also id.*, 9:8-9.)



(*Id.*, Fig. 1.)

Roberts provides examples of the types of devices connected to its network. A desktop computer (one example of a “computer 10”) is already connected to “wireless network 304” managed by “access point 306” and can serve as a “registrar.” (*Id.*, 4:51-57.) A “notebook computer 300” (another example of a “computer 10”) seeks to join this network and thus is an “enrollee device.” (*Id.*, 4:54-52.)



(*Id.*, Fig. 3.) Networks 11 and 304 are examples of the claimed “*communications network.*” The new enrollee device that seeks to join these networks is the claimed “*target device.*” (See Ex. 1003, ¶¶ 120-129.)

[1-1] “at the target device including a microprocessor, a wireless radio, and commissioning logic:”

[11-1] “a microprocessor; a wireless radio; a commissioning logic; and a memory storing programs for execution by the target device, the programs further including instructions for:”

[16-1] “the target device including a microprocessor, a wireless radio, and commissioning logic, the one or more programs comprising instructions for:”

Roberts teaches these limitations, or at least renders them obvious. According to Roberts, Fig. 2 provides an “example of a basic configuration for a computer 10.”

(Ex. 1004, 3:54-56.)

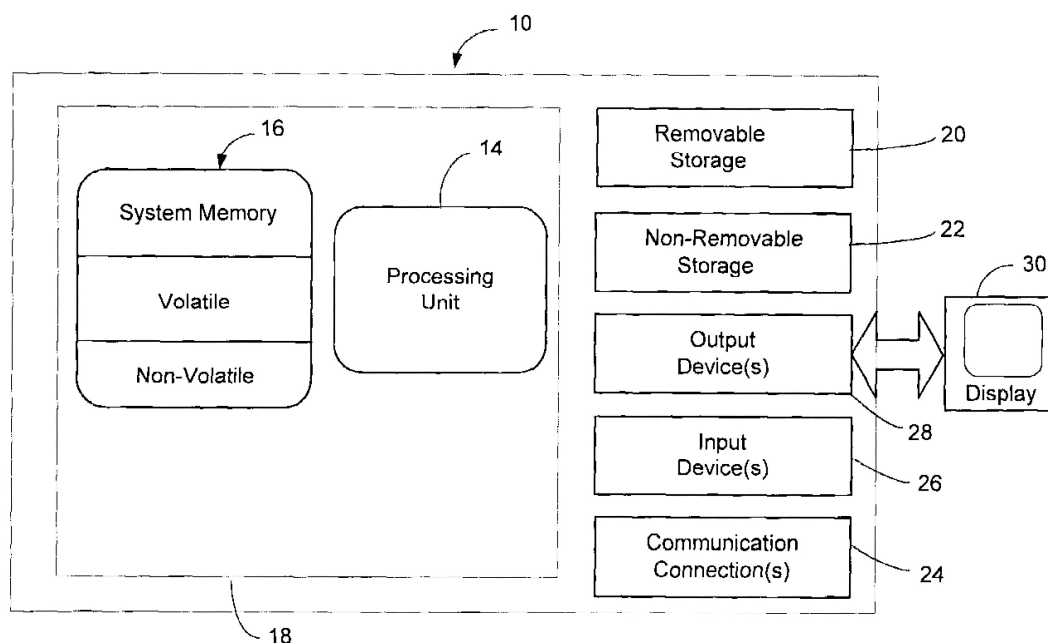


FIG. 2

(*Id.*, Fig. 2.) Computer 10 can be either a “registrar device” (an existing device on Roberts’s network) or an “enrollee device” (a device seeking to join the network).

(*Id.*, 4:51-54.)

Each enrollee device—Roberts’s *“target device”*—“typically includes at least one processing unit 14.” (*Id.*, 3:54-58.) The device also includes “memory 16” that can store “instructions” or “programs” that may be executed by the processing unit “to carry out tasks” such as the provision of configuration information. (*Id.*, 3:15-16, 3:57-60.) Thus, Roberts’s devices include both the claimed *“microprocessor”* and *“commissioning logic”* with *“programs”* or *“instructions.”* (See Ex. 1003, ¶¶ 130-136.)

While Roberts does not use the exact phrase *“wireless radio,”* a POSITA would nonetheless have recognized that this component is obviously present. Roberts’s devices can join and communicate over a “wireless” or “Wi-Fi network.” (Ex. 1004, 1:27-29, 56-65; 3:41-46; 9:8-10.) In addition, Roberts explains that each device on its network includes “communication connection(s) 24 that allow the device to communicate with other devices.” (*Id.*, 4:18-20.) This connection enables transmission and receipt of “a modulated data signal such as a carrier wave or other transport mechanism” over a “wireless network” via “RF” or other “wireless” means. (*Id.*, 4:21-32.) Given that Roberts engages in wireless communications and transmits modulated signals wirelessly, a POSITA would have recognized that it obviously includes a wireless radio to implement these teachings. (See Ex. 1003, ¶¶ 137-145.)

[1-2], [11-2], [16-2] “receiving a request to initiate a commissioning process with the target device;”

This step is performed by the “target device.” The claim does not specify or limit how the “request to initiate” is received by that device. There is no requirement that the request be received via any particular manner of communication, or from any particular entity. Consistent with this, the ’615 patent explains that it was known that “pushbutton switches” could be used to “initiate the exchange of configuration data.” (Ex. 1001, 5:43-47.) Likewise, a “touchscreen ... and display” can be used to “initiate execution of ... program instructions” for commissioning. (*Id.*, 9:36-37.) Moreover, the claims allow the “request” to be “receiv[ed]” *before* a “short-range signal transmission path” is created. This confirms that the claimed “request” does not need to originate from another device, let alone the claimed “wireless device” (as the “target device” does not yet necessarily even have a path by which to communicate with the “wireless device” when the request is received).

Roberts teaches what this limitation requires. In particular, the process for “configuring” a new device begins when “the power for the enrollee device 300 is turned on.” (Ex. 1004, 5:44-48.) Then, either “automatically” or after the device “user ... initiate[s] the sequence,” the “enrollee device 300 broadcasts information about itself and its capabilities” in the form of an “enrollee information element 514.” (*Id.*, 5:48-53.) The device power followed by automatic initiation, or later user initiation, is the claimed *“request to initiate a commissioning process.”* This

“request” is “*receiv[ed]*” by the “target device.” More particularly, the enrollee receives either the power on request (which can automatically trigger the process) or the separate user input requesting initiation (which can also trigger the process). And this “request” is to “initiate a commissioning process *with the target device*” because either the power on request or the separate user input both trigger the performance of further steps required for commissioning (like transmission of element 514) at the target device. Again, the ’615 patent itself similarly explains that user activation of a switch or touchscreen can “initiate” a commissioning process. (See Ex. 1001, 5:43-47, 9:36-37; see also Ex. 1003, ¶¶ 146-162.)

Even if this limitation somehow requires that the “request” be received from the claimed “wireless device” (it does not), this also would have been obvious. Roberts teaches that its system can employ Bluetooth. (Ex. 1004, 2:6-10.) And, as part of the Bluetooth connection setup process, “LMP_host_connection_req” and “LMP_accepted” messages are exchanged. (Ex. 1019, pp. 474, 628-629, 1131-1133.) The “accepted” received at Roberts’s enrollee device is also the claimed “request” because it allows the later request for and transmission of configuration information over Bluetooth to occur. (See Ex. 1003, ¶ 162.)

[1-3], [11-3], [16-3] “establishing a short-range signal transmission path with a wireless device independently of the communication network;”

This limitation is taught by Roberts. Asokan confirms that a POSITA would have implemented Roberts in the manner discussed below. In Roberts a new

enrollee device seeking to join a network communicates with a “registrar” “device ... already connected to the network.” (Ex. 1004, 1:52-55; *see also id.*, Abstract; Fig. 5.) This registrar device is the claimed “*wireless device.*” (*See* Ex. 1003, ¶¶ 163-165.)

Roberts explains that as part of this process, a “connection” between the “enrollee” and “registrar” is created to facilitate the communication of “configuration information.” (Ex. 1004, 2:6-10; *see also id.*, 9:17-20 (“[T]he enrollee device ... sets up control channels for communication.”); 9:42-45 (noting that the “probe request” sent by an enrollee “carr[ies] ... capability information needed to establish direct communication between two wireless devices”).) This can be, for example, “a temporary direct data connection.” (*Id.*; 7:43-52.) More specifically, a dedicated “L2 data port” “control channel” is “open[ed] for only setup traffic” between the enrollee and registrar. (*Id.*, 11:18-21; 11:33-40, 62-65; *see also id.*, 12:1-6 (similar).) This “de-couples” the “setup exchange from the specific wireless technology” used by the network. (*Id.*, 11:19-22.) Either “in band” or “out of band” communication can be employed. (Ex. 1004, Abstract; 1:66-2:19; 6:26-28; 7:43-52.) One example of such “out of band” communication includes “a Bluetooth™ connection.” (*Id.*, 2:6-10.) A separate communication channel between the enrollee and registrar device—via, for instance, a direct Bluetooth connection—

is an example of the claimed “*short-range signal transmission path*” that is “*independent[] of the communication network.*” (See Ex. 1003, ¶¶ 166-177.)

Roberts does reference both in-band and out-of-band communication such as Bluetooth. A POSITA would nonetheless have selected, would have considered it obvious, and would have been motivated to use an out-of-band channel when implementing Roberts. Again, Roberts itself instructs a POSITA to do so. (See Ex. 1004, 2:6-10; 7:46-52.) Asokan confirms that a POSITA not only would have considered use of an out-of-band channel with Roberts, but would have preferred such a method of communication. Asokan—like Roberts—relates to “[m]ethods and systems for managing access to a wireless local area network.” (Ex. 1006, Abstract; ¶ [0002].) Asokan’s system allows for the addition of a new device to an existing “high speed wireless LAN” employing the 802.11 standard. (*id.*, ¶ [0023], ¶ [0003].) Asokan’s system “utilizes an out-of-band channel ... to communicate authentication key and network address information to a ...device” to be added to the network, “and utilizes [the] in-band channel” (*i.e.*, the wireless LAN) “to establish communications with the” device. (*Id.*, ¶ [0010].) The employed out-of-band channel can be based on “NFC, short range wireless communication, infrared, Bluetooth, UWB, WiFi, RFID, USB memory stick, etc.” (*Id.*) Use of this “out-of-band channel” provides various benefits, including “increase[d]... security and

usability.” (*Id.*, ¶ [0010]; *see also* Abstract; ¶ [0025]; *see also infra* Section IX.A.B; Ex. 1003, ¶¶ 178-186.)

[1-4], [11-4], [16-4] “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;”

In Roberts, the network configuration process can begin automatically when an enrollee device is powered on or when initiated by the device user. (*See* Ex. 1004, 5:44-53.) This causes the enrollee device to transmit an “enrollee information element 514.” (*Id.*, 5:48-50; Fig. 6.) According to Roberts, “element 514” is then received by a “registrar” device. (*See id.*, 7:11-12; *see also id.*, 7:25-29 (explaining that the element 514 may be “directly” received by a registrar from the enrollee).) This then triggers the “registrar” to “provide[] ... configuration information to the enrollee.” (*Id.*, 7:31-33; *see also* 1:66-2:2.)

The configuration information transmitted by the registrar can be sent to the enrollee “via the same channel through which the enrollee information element 514 was broadcast.” (*Id.*, 7:43-52.) Again, this can include an “out of band” communication connection such as a “Bluetooth™ connection.” (*Id.*, 2:6-10; *see also id.*, Abstract; 6:23-27; 7:43-52.) As discussed, a POSITA would have

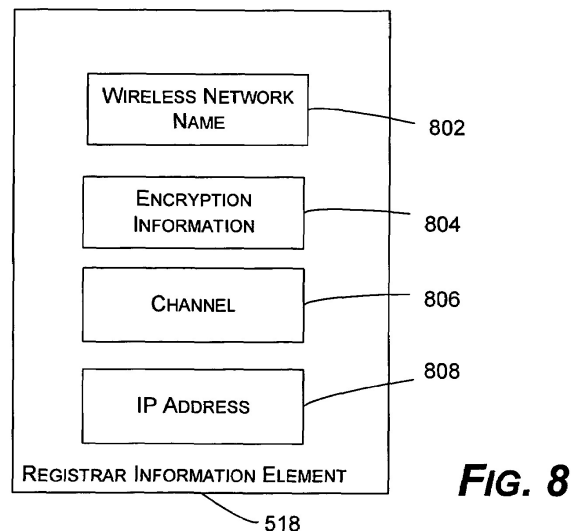
considered it obvious to employ an out-of-band connection when implementing Roberts. (*See supra* discussion of limit [1-3]; Ex. 1003, ¶¶ 187-193.)

Next, Roberts explains that its system can transmit network configuration messages as “data packet[s].” (Ex. 1004, 12:28-29; *see also* 11:65-67 (“media specific data frames” are employed during setup”); 12:7-11 (“[t]he registrar device ... transmits and receives setup frames ... as L4/L3 packets”); 12:64-13:11 (“the 802.11 stack encapsulates the setup message from a registrar device ... in an 802.11 data packet” for transmission to an “enrollee device”).) This packet can include various information fields, including a header and address “to ensure that the targeted enrollee device ... directly receives the packet.” (*Id.*, 13:2-11.) Because the packet format is fixed and includes various required fields determined in advance to facilitate commissioning, it has a **“predetermined data format”** as claimed. (*See* Ex. 1003, ¶¶ 194-197.)

Even if Roberts did not itself already teach the use of packets with defined formats, a POSITA would have considered this obvious. According to Roberts, the enrollee and registrar can communicate via, for example, a “Bluetooth™ connection.” (Ex. 1004, 2:6-10.) Bluetooth employs a standardized “packet” format. (*See, e.g.*, Ex. 1017, 2:15-17; 4:57-58; 5:59-61; Fig. 3.) Again, the packet structure is standardized, determined, and fixed in advance and thus has a **“predetermined data format.”** A POSITA would have understood Roberts to

employ this standardized packet format when engaging in Bluetooth communications. (See Ex. 1003, ¶¶ 198-202.)

Figure 8 of Roberts shows an example of the configuration information that can be conveyed to an enrollee in the packetized “registrar information element 518.” (Ex. 1004, 7:30-35.) This includes the “wireless network name” and “encryption information ... such as an encryption key” for the network. (*Id.*, 7:35-42; *see also id.*, 1:29-32)



(*Id.*, Fig. 8.) Transmission of a packetized information element 518 from the registrar device to the enrollee device is shown in both Figures 5 and 6:

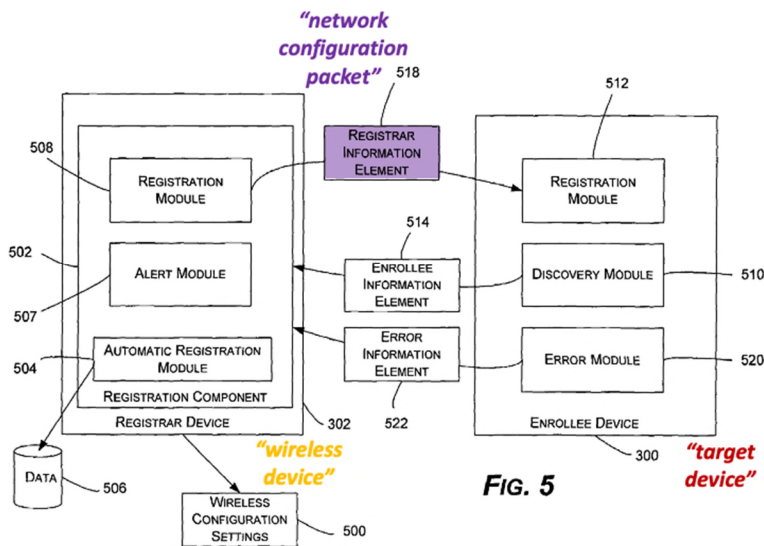


FIG. 5

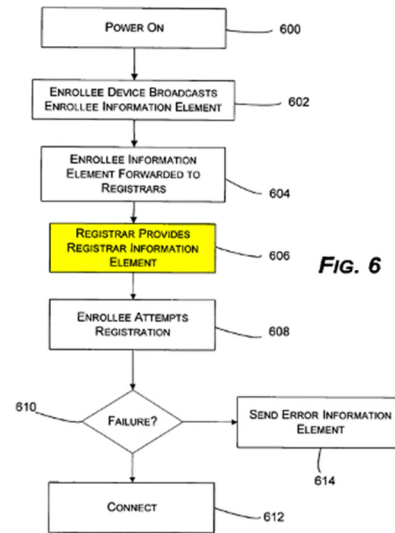


FIG. 6

(*Id.*, Figs. 5, 6; Ex. 1003, ¶¶ 203-206.)

Thus, in sum, in Roberts a ***“wireless device”*** (the registrar device) sends a ***“network configuration packet”*** (the packetized registrar information element 518) over ***“the short-range transmission path”*** (the Bluetooth or other out-of-band communication path) to a ***“target device”*** (the new enrollee device). Again, the packet is in a ***“predetermined data format”*** (it can be a standardized data packet with a header, address, and other information) and includes at least a ***“security passphrase”*** (the network key). (*See id.*, ¶¶ 207-208.)

[1-5], [11-5], [16-5] “executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and”

Roberts explains that its “invention may be implemented by programs that are executed” on its enrollee and registrar devices. (Ex. 1004, 3:15-16; *see also id.*, 1:47-52 (“a routine may be run to provide the device with necessary configuration

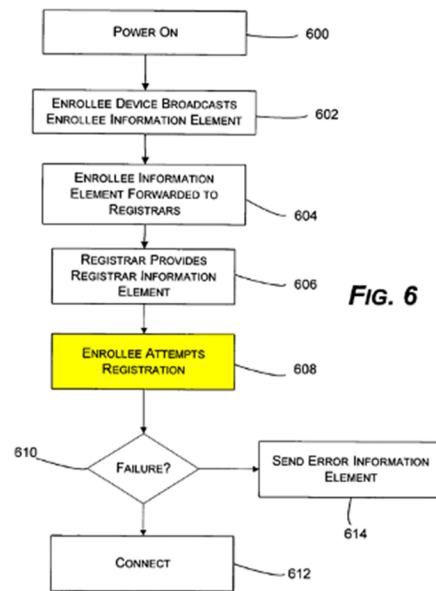
settings”); 3:58-60 (each device “executes instructions” for network configuration).) A POSITA would have understood that these programs would, among other things, perform the “steps for discovering and configuring an enrollee device” shown in Figure 6. (*See id.*, 5:44-47.) Thus, Roberts’s “*target device*” (the enrollee) “*execut[es] an application*” (the programs). (Ex. 1003, ¶¶ 209-212.)

Further, Roberts explains that upon receipt of a packetized registrar information element 518, an enrollee extracts and uses “the configuration information within” the element for purposes of joining a network. (Ex. 1004, 8:39-43; Fig. 6.) More particularly, the enrollee “receives the packet,” “strips off the ... header” and then “locally consumes the received packet” to facilitate completion of the network configuration process. (*Id.*, 13:16-24.) Packets complying with other standards—such as Bluetooth—would be similarly processed upon receipt. (*See* Ex. 1003, ¶¶ 213-217.) Because the transmitted packetized element 518 is processed and information is extracted to configure the enrollee, in Roberts “*the target device*” (the enrollee) “*decode[s] and process[es]*” packets for purposes of “*recover[ing] the network configuration data*” they contain. (*Id.*)

[1-6], [11-6], [16-6] “after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.”

Roberts explains that its system operates to “provision[] a wireless network device with information needed to connect to a wireless network.” (Ex. 1004, 4:38-

42; *see also id.*, Abstract; 1:46-55.) Thus, upon receipt of a “registrar information element 518” (which, as discussed above, can be a packet received over an out-of-band channel such as Bluetooth), an enrollee device “attempts registration with the wireless network using the configuration information within the ... element 518.” (*Id.*, 8:39-45.) This is shown in Figure 6:



(*Id.*, Fig. 6 (annotated).) If successful, “the enrollee device connects to the wireless network”—step 612 above—for purposes of communication with other networked devices. (*Id.*, 8:43-46; 13:51-56 *see also* Ex. 1003, ¶¶ 218-222.)

2. Claim 2

“2. The method of claim 1, wherein the wireless device is selected from a group consisting of a smartphone and a tablet computer.”

This is rendered obvious by Roberts. Roberts explains that various different “computer[s]” can be connected to its network and serve as a registrar. (Ex. 1004,

3:21-29.) This includes “any device that electronically executes one or more programs” such as “personal computers (PCs), hand-held devices, multi-processor systems, microprocessor-based programmable consumer electronics, network PCs, minicomputers, mainframe computers, consumer electronics having a microprocessor or microcontroller, routers, gateways, hubs, or other electronic devices.” (*Id.*) While Roberts does not specifically mention a “*smartphone*” or “*tablet computer*,” at the time the ’615 patent was filed, these types of devices were well-known and in routine use. (*See, e.g.*, Ex. 1006, ¶ [0023] (known “[w]ireless devices” can include, among other things, “smart phones”).) Given this—coupled with Roberts’s own disclosure that its teachings apply to and can be used with “hand-held devices” and various other computers—a POSITA would have understood that Roberts’s registrar device could obviously be either a “smartphone” or “tablet computer.” (*See* Ex. 1003, ¶¶ 223-229.)

3. Claim 3

“3. The method of claim 1, wherein information received via the short-range signal transmission path is received at a first wireless radio of the target device, and the first wireless radio employs at least one of a plurality of radio modulation techniques including frequency shift keying (FSK), phase shift keying (PSK), on-off keying (OOK), and quadrature amplitude modulation (QAM).”

This is rendered obvious by Roberts and Asokan. In particular, Roberts explains that its enrollee device—the claimed “*target device*”—may include various “communication connection(s) 24 that allow” it “to communicate with other

devices.” (Ex. 1004, 4:18-20.) This can include “out of band communications.” (*Id.*, 2:6-10, 7:46-52, 10:8-9.) Similarly, Asokan teaches that a device to be added to a network preferably includes hardware allowing communication over an “out-of-band channel.” (Ex. 1006, ¶ [0010].) This hardware is the claimed “***first wireless radio of the target device.***” (See Ex. 1003, ¶¶ 230-234.)

Moreover, Roberts explains that when adding new “enrollee” device to an existing network, a “connection” with a “registrar” is created to facilitate the communication of “configuration information.” (Ex. 1004, 2:6-10; 7:43-52.) Again, Asokan teaches that this connection should preferably be an “out-of-band channel.” Thus, Roberts and Asokan together teach communications hardware that allows “***information***” to be “***received via the short-range signal transmission path.***” (See Ex. 1003, ¶¶ 235-237.)

Next, both Roberts and Asokan explain that the out-of-band channel used to transmit network information can be a Bluetooth channel. (Ex. 1004, 2:6-10; Ex. 1006, ¶ [0010].) A POSITA would have recognized that Bluetooth employs the types of modulation techniques this claim requires, including at least “***frequency shift keying (FSK)***” or “***phase shift keying (PSK).***” (See Ex. 1003, ¶¶ 238-241.) The claimed modulation techniques are not specific or unique to the ’615 patent. Instead, as the ’615 patent itself recognizes, they are simply those used by “well-known communication protocols.” (Ex. 1001, 10:1-6.) Standardized Bluetooth

transmissions employ either FSK or PSK modulation. (*See, e.g.*, Ex. 1017, 1:24-37; *see also* Ex. 1003, ¶¶ 238-241.)

4. Claim 5

“5. The method of claim 1, wherein the short-range signal transmission path is associated with a communication channel based on one of Bluetooth communication, radio frequency identification (RFID), Zigbee, radio frequency for consumer electronics (RF4CE), Z-Wave, and near field communication.”

This is rendered obvious by Roberts and Asokan. Roberts explains that an “out of band” “connection,” including a “Bluetooth” connection, can be used to transmit configuration information to an enrollee. (Ex. 1004, Abstract, 2:6-10, 6:23-27, 7:43-52.) Asokan explains that out-of-band channel such as Bluetooth can (and should) be used for this purpose. (Ex. 1006, ¶ [0010]; Ex. 1003, ¶¶ 242-245.)

5. Claim 6

“6. The method of claim 1, further comprising: contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.”

This is rendered obvious by Roberts and Asokan. Roberts explains that if enrollee device “setup succeeds,” then the device “deletes the L2 data port” it previously used to communicate with the registrar and reconfigures its “802.11 stack with an 802.11 profile and credentials to connect the enrollee device ... as a member of the 802.11 network domain.” (Ex. 1004, 13:51-57.) After this, “[o]n a registrar device,” the matching “L2 data port” is also deleted. (*Id.*, 13:58-62.) Because the enrollee deletes the L2 data port it used for setup upon joining a network, a POSITA

would understand that any further messages or notifications sent to the registrar—which obviously includes a notification that the setup was successful such that the registrar can delete its own matching L2 port—would be transmitted over the wireless network itself. (See Ex. 1003, ¶¶ 246-251.) This is consistent with the remainder of Roberts’s disclosure. For instance, Roberts explains that its system operates to “give[] system wide visibility into setup progress.” (Ex. 1004, 11:32-33; *see also* Ex. 1003, ¶¶ 252-254.)

6. Claim 7

“7. The method of claim 6, further comprising: after contacting the wireless device, continuing the commission process, including receiving, via the communication network, device configuration data from the wireless device.”

This is obvious in view of Roberts and Asokan. As shown in Figure 4, Asokan teaches that a network configuration process employing an out-of-band channel can employ multiple steps:

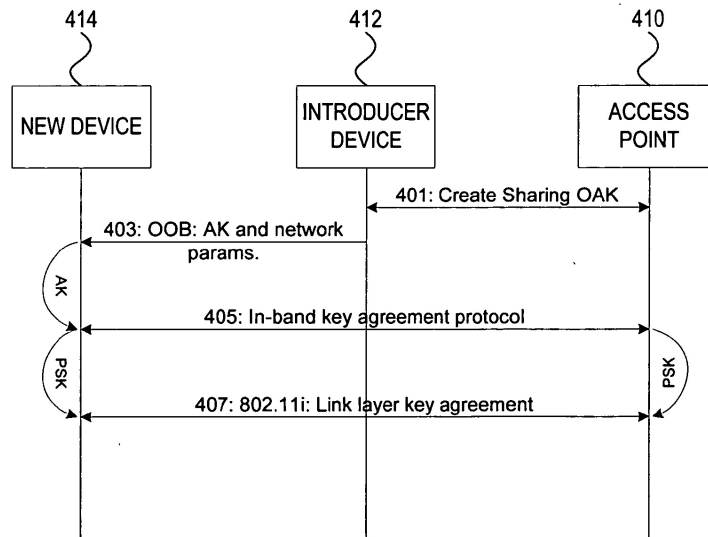


FIG. 4

(Ex. 1006, Fig. 4.) A “new device 414” first receives a network “authentication key” (or “AK”) and network parameters such as the “address of the AP” and the network “SSID” “via an out of band channel” from an “introducer device 412.” (*Id.*, ¶ [0026].) “[T]he introducer can be the AP itself.” (*Id.*, ¶ [0005].) Then, to complete the process, the “new device 414” uses the AK and network parameters to initiate further back-and-forth in-band communication over the 802.11-based WLAN with the “access point 410.” (*Id.*, ¶¶ [0026]-[0027]; Fig. 4; *see also id.*, ¶¶ [0011]-[0013], [0052] (the “AK” is used to “authenticate” the new device); [0057] (the “AK can be a “derived PSK,” a “random passphrase,” or other value).) This can entail receipt of a formal network “key for the new device” (or “PSK”) and receipt of “link layer key agreement” communications. (*Id.*, ¶¶ [0026]-[0027]; Fig. 4; *see also* ¶ [0003].) Use of this multi-step procedure—instead of a more simplistic procedure where the PSK

is provided directly to the new device—allows for enhanced control over guest access. (*See id.*, ¶ [0010].)

These further in-band communications are the claimed ***“contin[ation of] the commission process”*** that entails ***“receiving, via the communication network, device configuration data from the wireless device.”*** (*See* Ex. 1003, ¶¶ 255-263.)

More particularly, the claimed “network configuration data” with a “security passphrase” required by claim 1—network parameters and the AK—are first received via the out-of-band channel. Then, the further “device configuration data” required by claim 7—the link layer communications and PSK—are received via Wi-Fi. (*See id.*, ¶¶ 264-265.)

Moreover, when the ’615 patent was filed, “current technology normally uses DHCP (Dynamic Host Configuration Protocol) to implement high-efficiency dynamic IP address allocation.” (Ex. 1018, 1:52-54.) In DHCP, a “server automatically provides the client with an IP address and other Internet parameters.” (*Id.*, 1:60-61.) Further, the server not only engages in initial device registration, but also “[r]e-registration” when a client attempts to “re-register on the network” it has already joined. (*Id.*, 2:36-40.) This can entail providing the client with a “new IP address” if necessary. (*Id.*, 2:40-50.) Again, in the prior art, the network’s access point can be the entity that transmits configuration information to a new client device. (*See* Ex. 1006, ¶ [0005].) A POSITA would have understood that this access

point would also be (or at least could obviously be) the network’s DHCP server responsible for client device IP address management. The DHCP messages transmitting IP address information from the access point to the client device—in particular the re-registration messages transmitted after the client already joined the network—also constitute the claimed “*device configuration data.*” (See Ex. 1003, ¶¶ 266-273.)

7. Claim 8

“8. The method of claim 7, wherein the device configuration data including at least one of an Internet Protocol address, proxy, and gateway configuration.”

This is taught by Roberts and Asokan: In Roberts, the “registrar information element 518,” transmitted to a new device as multiple packets, can include an “IP address 808.” (Ex. 1004, 7:33-42.) Further, in Asokan, initial out-of-band communications include only an AK, the address of the access point, and the SSID. (See Ex. 1006, ¶ [0026]; Fig. 4.) Any other needed network configuration data—which would obviously include the IP address Roberts’s system transmits—are sent later over the WLAN network itself. (See *id.*; see also *supra* Section IX.A.6; see also Ex. 1003, ¶¶ 274-278.) Moreover, as explained above, a POSITA would also have understood that the network access point would transmit DHCP messages including IP address assignment information. (See *supra* Section IX.A.6.)

8. Claim 9

“9. The method of claim 1, further comprising: generating one of a visual indication and an audio indication to a user about a status of the commissioning process.”

Roberts explains that as part of its network configuration process, displays on both the enrollee and registrar device can provide the user with status information. For instance, an “alert” can be “provided at a registrar device ... upon receipt of an enrollee information element 514.” (Ex. 1004, 8:13-15.) As shown below, this can be a “bubble message 1000” that “indicates that an enrollee device ... is requesting configuration information.” (*Id.*, 8:25-30.)

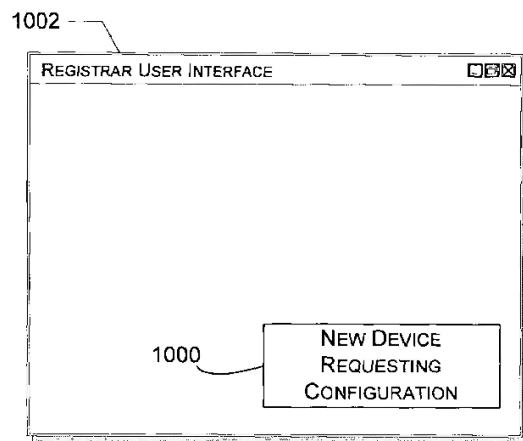


FIG. 10

(*Id.*, Fig. 10.) The user may be required to “click or otherwise select the bubble” for the process to proceed. (*Id.*, 8:30-32; *see also* Figs. 9, 11; 8:34-38 (explaining that the enrollee device may display a PIN the user needs for the process to continue).) A POSITA would have understood that similar alerts regarding commissioning

status would have been provided on the enrollee device. (*See* Ex. 1003, ¶¶ 279-284.)

Because the message alerts the user that the commissioning process has begun and requires user input to continue, it provides an **“indication”** regarding the **“status of the commissioning process”** as required. (*Id.*)

9. Claim 10

“10. The method of claim 1, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Roberts for the same reasons discussed for limitation [1-1]: Roberts employs a “program” or “instructions” executed on each enrollee device to perform network configuration. (*See supra* Section IX.A.1.[1-1]; Ex. 1003, ¶ 285.)

10. Claim 12

“12. The target device of claim 11, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Roberts for the same reasons discussed for claim 10. (*See supra* Section IX.A.9; Ex. 1003, ¶ 286.)

11. Claim 15

“15. The target device of claim 11, wherein the communication network includes a wireless local area network (WLAN).”

This is taught by Roberts: the network joined by the enrollee can be an 802.11-based “Wi-Fi Network.” (Ex. 1004, 1:27-29, 60-65; *see also id.*, 9:8-9; Ex. 1003, ¶¶ 287-289.)

12. Claim 17

“17. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for: generating one of a visual indication and an audio indication to a user about a status of the commissioning process.”

This is taught by Roberts for the same reasons discussed for claim 9. (*See supra* Section IX.A.8; Ex. 1003, ¶ 290.)

13. Claim 18

“18. The non-transitory computer readable storage medium of claim 16, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Roberts for the same reasons discussed for claim 10. (*See supra* Section IX.A.9; Ex. 1003, ¶ 291.)

14. Claim 19

“19. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for: contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.”

This is taught by Roberts for the same reasons discussed for claim 6. (*See supra* Section IX.A.5; Ex. 1003, ¶ 292.)

B. Motivation to Combine

A POSITA would have considered it obvious and would have been motivated to apply Asokan’s teachings to Roberts. (*See* Ex. 1003, ¶¶ 293-320.)

Asokan explains that employing only an “in-band” communication channel when commissioning a new network device “present[s] a variety of problems.” (Ex.

1006, ¶ [0006].) For instance, it creates the “possibility of accidentally pairing with an unintended device and the threat of a man-in-the-middle attack.” (*Id.*) Further, “guest access is cumbersome..., and no device-to-device delegation of access rights is possible.” (*Id.*) Asokan goes on to explain that its system overcomes these issues and provides a “simpler and more efficient wireless network setup and administration.” (Ex. 1006, ¶ [0008]. In particular, “[t]he ability to use out-of-band where possible provides for an increase to security and usability....” (*Id.*, ¶ [0010]; *see also* Abstract; ¶ [0025].)

This would have provided a POSITA with a strong motivation to employ a separate, out-of-band communication channel when implementing Roberts’s system. (*See* Ex. 1003, ¶¶ 295-301.) By employing an out-of-band channel, Roberts’s network configuration process would be simplified and rendered more user friendly. The registrar device would no longer need to leave the existing network and join a new, ad hoc wireless network for purposes of relaying network information to another device. (*See id.*, ¶¶ 302-305.) Instead, because an out-of-band channel like Bluetooth is used, it could remain on the network throughout the process. (*See id.*, ¶ 304.) Because less back-and-forth network switching would be required, a POSITA would have considered use of an out-of-band channel to result in a system that is more user friendly and easier to work with. (*See id.*, ¶ 305.)

A POSITA would also have been motivated to applying Asokan's teachings and implement Roberts such that it employs an out-of-band communication channel during network configuration because doing so would improve the security of Roberts. For instance, by using an out-of-band channel instead of the wireless network itself, the transmission range of the network setup communications would be substantially reduced. (*See id.*, ¶¶ 306-309.) While a wireless network has a transmission range on the order of 100 feet, Bluetooth is limited to approximately 10 feet. (*See id.*, ¶ 307.) A POSITA would have understood that this shorter transmission range would reduce the chance that network setup communications would be either inadvertently or intentionally intercepted by devices other than that the user seeks to add to the network. (*See id.*, ¶¶ 308-309.)

Asokan's system also provides other benefits. For example, Asokan explains that its system allows for "easy management of guest access." (Ex. 1006, ¶ [0010].) It does this by transmitting different types of authentication keys to new devices. (*See id.*, ¶ [0028].) The access point can then revoke access to devices authenticated using a particular type of key, such as a "guest" key. (*See id.*) A POSITA would have understood that this also would have improved Roberts. Following Asokan, Roberts's network access point would be able to distinguish guest devices from other devices that are a permanent part of the network. (*See Ex. 1003*, ¶¶ 310-314.) Guest network access could then be readily managed. (*See id.*)

Next, Roberts is already open to and allows for the use of out-of-band communication channels during new device commissioning. (*E.g.*, Ex. 1004, Abstract; 1:66-2:19; 6:26-28; 7:43-52.) A POSITA would have considered the use of Asokan’s other teachings—in particular, its multi-step configuration process—with Roberts to be nothing more than a routine design choice. (*See id.*, ¶¶ 315-320.) “[W]hen a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious.” *KSR Int’l Co. v. Teleflex Inc.*, 550 US 398, 406 (2007). A POSITA would understand that the combined system would continue to operate as intended, providing the benefits of both Roberts and Asokan: network configuration would still occur at least in part via an out-of-band communication channel, but additional guest management capabilities would be provided. (*See id.*, ¶¶ 317-320.)

A POSITA would also have had a reasonable expectation of success. Both Roberts and Asokan relate to methods and systems for managing access to a wireless network. (*E.g.*, Ex. 1004, 2:1-3; Ex. 1006, ¶ [0002].) Further, both discuss the use of out-of-band communication channels such as Bluetooth during network configuration. (*See, e.g.*, Ex. 1004, 1:66-2:19; 6:26-28; 7:43-52; Ex. 1006, ¶¶ [0010], [0026].) This similarity in purpose and design would have given a POSITA

every reason to believe that the references' teachings can be successfully combined.
(See Ex. 1003, ¶¶ 321-324.)

X. Ground 2: Claims 1-3, 5-12, and 15-19 Are Obvious Over Suumäki

When considered in view of the knowledge of a POSITA, Suumäki (Ex. 1005) also renders claims 1-3, 5-12, and 15-19 obvious.

Again, Suumäki relates to a system where an out-of-band NFC communication link is used to transmit network configuration information from an existing device on a wireless network to a new device. The information allows the new device to join the network.

A. Claim-by-Claim Analysis

1. Claims 1, 11, and 16

Similar independent claims 1, 11, and 16 will again be addressed together.

[1-p] “1. A method for commissioning a target device onto a communication network, comprising:”

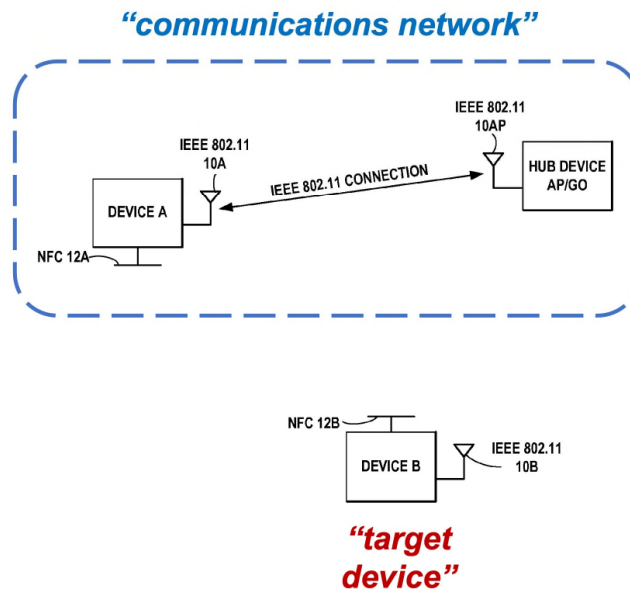
[11-p] “11. A target device, comprising:”

[16-p] “16. A non-transitory computer readable storage medium storing one or more programs configured for execution by a target device for commissioning the target device onto a communication network,”

To the extent limiting, this is taught by Suumäki. Suumäki relates to “wireless communication ... connection setup ... using an out-of-band carrier.” (Ex. 1005, 1:9-11; *see also id.*, 2:7-10.) Suumäki references a variety of “communication technologies,” including an “IEEE 802.11 wireless local area network (WLAN). . . .”

(*Id.*, 1:39-51; *see also id.*, 3:32-40.) Stored program logic or instructions are executed to control this process. (*Id.*, 24:43-49.)

Figure 1B is an “example network diagram” where a “device A” is connected to “a WLAN network by having formed an IEEE 802.11 in-band short-range carrier communication connection with the hub device” or “access point” “AP/GO[.]” (*Id.*, 7:28-35; *see also id.*, 20:65-21:3.) This WLAN network managed by the hub device is the claimed “**communications network**.” Suumäki’s system and method is meant to commission another device—“device B”—onto this network. (*See id.*, 7:20-8:9.) “Device B” is an example of the claimed “**target device**.” (*See Ex. 1003, ¶¶ 329-337.*) This is shown below:



(Ex. 1005, Fig. 1B (annotated).)

[1-1] “at the target device including a microprocessor, a wireless radio, and commissioning logic:”

[11-1] “a microprocessor; a wireless radio; a commissioning logic; and a memory storing programs for execution by the target device, the programs further including instructions for:”

[16-1] “the target device including a microprocessor, a wireless radio, and commissioning logic, the one or more programs comprising instructions for:”

Suumäki explains that “device A” and “device B” in Figure 1B may be a “cellular telephone, PDA, laptop computer, and the like.” (Ex. 1005, 20:50-64; 23:34-36.) “FIG. 2” provides a “functional block diagram” of the devices. (*Id.*, 8:16-20; 23:22-23.) Each includes a “processor 20.” (*Id.*, 23:36-41.) This is the claimed “*microprocessor*.” The devices also include “one or more in-band short-range carrier transceivers” like a “transceiver ... 10B ... that use[s] the IEEE 802.11 protocol.” (*Id.*, 23:26-30.) This component has a “radio for IEEE 802.11 WLAN communications.” (*Id.*, 23:47-50.) This is the claimed “*wireless radio*.” Further, the devices include memory with “program logic stored ... in the form of sequences of instructions, which, when executed in the CPU, carry out” Suumäki’s connection setup method. (*Id.*, 23:39-47 24:43-49.) This is the claimed “*commissioning logic*.”

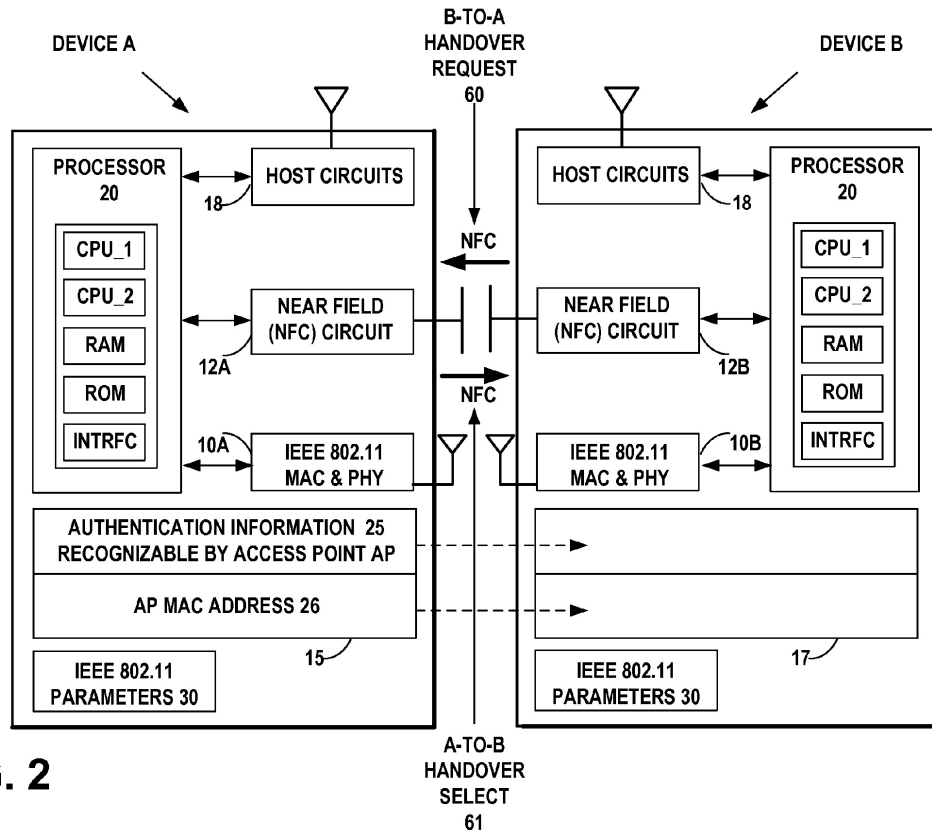


FIG. 2

(*Id.*, Fig. 2; *see also* Ex. 1003, ¶¶ 338-343.)

[1-2], [11-2], [16-2] “receiving a request to initiate a commissioning process with the target device;”

Suumäki teaches that its system allows “device B” (the claimed “*target device*”) to “activate a different wireless communication protocol” to obtain network access through the hub device AP/GO and join the existing infrastructure network....” (Ex. 1005, 25:2-6; *see also id.*, 21:32-37.) “Device B may use the NFC Forum Connection Handover protocol to request” network information “from device A.” (*Id.*, 25:7-10.)

More particularly, both device A and B are “equipped with an out-of-band NFC transceiver....” (*Id.*, 23:22-25.) This allows “the user of device A” to “touch[]” that device’s “NFC transponder ... to the NFC transponder of device B in order to initiate a short-range carrier transport switch procedure with device B.” (*Id.*, 21:37-44.) Upon occurrence of this “NFC touch event,” “device B send[s] an NFC handover request 60 ... to device A....” (*Id.*, 21:45-50.) This “request 60” constitutes a “request for information to enable device B to obtain network access through the hub device AP/GO.” (*Id.*, 21:49-51; *see also* Fig. 1D-1E Thus. Suumäki’s system allows a user of a **“target device”** to **“initiate”** a wireless network **“commissioning process”** by performing an NFC touch event. (See Ex. 1003, ¶¶ 344-352.) The NFC touch event is **“receive[d]”** by the target device when device A is brought in physical proximity. It is also a **“request”** to initiate a commissioning process **“with the target device”** because the ensuing commissioning process is carried out in device B in response to performance of the touch. (*Id.*) As explained, in the ’615 patent, user activation of a switch or touchscreen can similarly “initiate” a commissioning process. (See Ex. 1001, 5:43-47, 9:36-37; *see supra* Section IV.A.1.)

Even if this limitation did require receipt of a “request” from another device like the claimed “wireless device” (it does not), this would also have been obvious. Again, Suumäki employs standardized NFC-transmissions. (See Ex. 1005, 19:20-

48.) When engaging in such transmissions, a connection protocol is followed before exchange of handover request and select messages. (Ex. 1021 at 35-36.) This entails the initiating device sending a “CONNECT PDU” message and the touched device responding with a “CC PDU” message if the connection is accepted. (*Id.* at 19-20, 35-36.) The “PDU” message received at Suumäki’s device B also constitutes a “request” as claimed because it is a necessary prerequisite to the later request for and transmission of network information. (*See id.*; *see also* Ex. 1003, ¶ 352.)

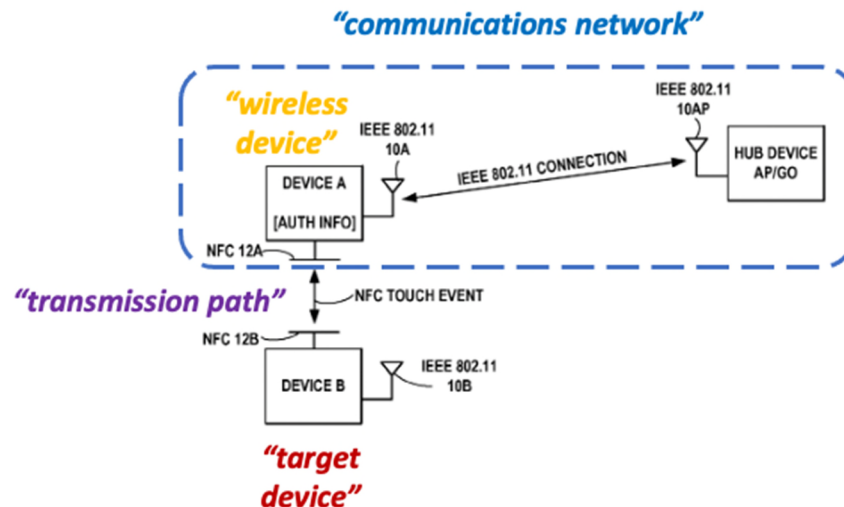
[1-3], [11-3], [16-3] “establishing a short-range signal transmission path with a wireless device independently of the communication network;”

Suumäki explains that both device A (an existing device on the network shown in Figure 1B) and device B (a device to be added to the network) include “in-band short range transceiver[s] ... that use of the IEEE 802.11 protocol.” (Ex. 1005, 23:26-30.) Device A is the claimed “*wireless device.*”

Further, both devices A and B include “out-of-band NFC transceiver[s].” (*Id.*, 23:23-25.) This allows device A to “transmit[s] NFC wireless out-of-band short-range carrier communication signals” to “device B” after the occurrence of an “NFC touch” event. (*Id.*, 21:31-44.). In other words, “[w]hen the user brings the two NFC equipped devices A and B into close proximity, ... they ... establish an NFC communication link...” (*Id.*, 24:65-25:1; *see also id.*, 18:67-19:3 (“A simple wave or touch ... establish[es] an NFC connection”); Figs. 1E-1F.)

The NFC-based communication link initiated by touching device A to device B is “out-of-band from the point of view of the in-band IEEE 802.11 protocol” used by the existing network. (*Id.*, 23:30-32.) Moreover, according to Suumäki, NFC is an example of a “short-range communication technolog[y].” (*Id.*, 1:39-55.) “NFC-compatible devices” are only able to communicate “when they are brought within close proximity.” (*Id.*, 1:62-65.)

Thus, the NFC communication link created by Suumäki between device A and device B for purposes of allowing device B to join another, existing network is the claimed “*short-range signal transmission path*” that is “*independent[] of the communication network.*” This path is shown in Figure 1D:



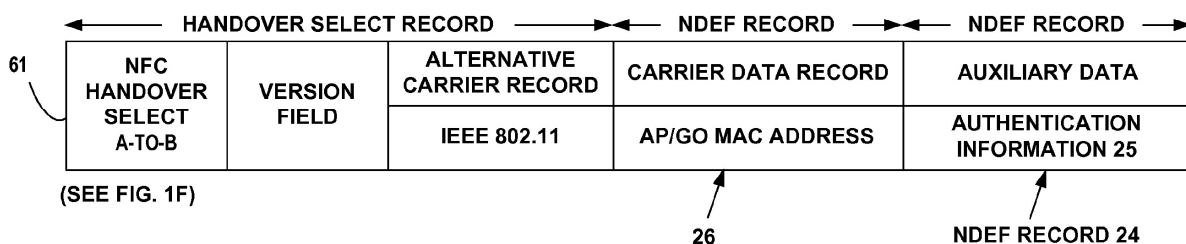
(*Id.*, Fig. 1D (annotated); see also Ex. 1003, ¶¶ 353-362.)

[1-4], [11-4], [16-4] “in response to receiving the request, receiving one or more network configuration packets from the wireless device via the short-range signal transmission path, wherein the one or more network configuration packets convey network configuration data associated with the communication network according to a predetermined data format, the network configuration data including at least a security passphrase for accessing the communication network;”

Suumäki explains that it “enable[s] connection setup ... using” an “out-of-band carrier.” (Ex. 1005, 2:7-9.) More particularly, device B is “automatically connect[ed] to the hub device AP/GO” managing an existing IEEE 802.11 wireless network “and acquire[s] credentials for network access, without requiring the user to type in a PIN number.” (*Id.*, 21:32-37; *see also id.*, 25:2-6.)

In this regard, after performance of an NFC touch event (the claimed “request to initiate”), the formation of an NFC communications link, and the transmission of a “NFC handover request 60,” device A sends device B a “handover response select message 61” that includes “authentication information 25 and connection information, such as the MAC address 26 of the hub device AP/GO, to carry out a connection setup between device B and the hub device AP/GO. (*Id.*, 21:52-59.) “FIG. 3B” shows an “example ... NFC handover select message 61....” (*Id.*, 25:60-61; Ex. 1003, ¶¶.)

FIG. 3B



(*Id.*, Fig. 3B; Ex. 1003, ¶¶ 364-368.)

Message 61 is in the form of an “NDEF message” comprised of a number of “NDEF record[s].” (Ex. 1005, 25:34-42, 60-64; *see also id.*, 20:24-25. This message format follows the “NFC Data Exchange Format (NDEF) specification,” which “defines a common data format for NFC devices to exchange application or service specific data.” (*Id.*, 20:20-24.) Suumäki explains that the “authentication information 25” that is part of message 61 “may include, for example, a random number of a value based on public key encryption” that is “recognizable by the hub device” and “serve[s] as proof” that device B properly requested network access. (*See id.*, 21:60-67; *see also id.*, 26:3-11.) Various other types of authentication information can be included in the message, including “temporary network keys” that are “valid only [for] certain time[s].” (*Id.*, 29:64-25:24.)

The “authentication information 25 carried in the NDEF record of the NFC handover select message 61” can also include the “SSID of [the] network” to be joined, the “Network type,” the “MAC address of the AP/GO,” the network “[c]hannel,” the network’s “[s]upported WPS methods,” and “other AP/GO device

identity information.” (*Id.*, 26:12-46; *see also id.*, 29:62-64.) Further “connectivity settings” can also be included. (*Id.*, 25:64-67; *see also id.*, 28:35-42 (the message includes “in-band communication connection parameters for enabling” device B “to join the wireless network and authentication information recognizable by ... an access point”).) This allows device B to communicate with the hub for purposes of obtaining network access. (*See id.*, 22:10-35.)

Suumäki also explains that the “NFC [h]andover [s]elect [m]essage” can be a “configuration record that” itself “includes credentials, such as network index, SSID, authentication type, encryption type, [and] network key... (Ex. 1005, 20:13-19; *see also id.*, 8:27-29; 19:55-62.) This message is analogous to that transmitted in the ’615 patent’s own example. (*See, e.g.*, Ex. 1001, 11:22-27 (explaining that “an exemplary commissioning packet ... includes a preamble field..., a header field..., a service set identifier (SSID) field...,” and “a key field”).).

In sum, the message 61 sent by device A to device B “**convey[s] network configuration data associated with the communication network**”: it includes information like the network’s SSID, channel, hub MAC address, and employed WPS method. (*See* Ex. 1003, ¶¶ 369-380.) In another embodiment, the message includes the network authentication type, encryption type, and key. The message also employs a “**predetermined data format**”: it is formatted as an NFC-standard NDEF message with NDEF records. (*See id.*; *see also id.*, ¶ 381.) And, the message

includes “*at least a security passphrase for accessing the communication network*”: a random number or public key encryption recognizable by the hub, a temporary network key, or even the permanent network key itself. (*See id.*, ¶ 382.)

While Suumäki does not explicitly characterize the NFC-based messages its system transmits as “*packets*,” a POSITA would nonetheless consider it obvious that the messages would have been in this form. Again, in Suumäki, network configuration data is transmitted from device A to device B over an NFC communication link in a NDEF “handover response select message 61.” (*See Ex. 1005, 21:52-59.*) And, this message is formed from a series of “NDEF record[s]” surrounded by “begin and end markers.” (*Id.*, 20:24-31; 25:34-42, 60-64; *see also id.*, Fig. 3B (message 61 includes multiple “NDEF record[s]”). A POSITA would understand the term “packet” to refer simply to “[a] unit of information transmitted as a whole from one device to another on a network.” (*Ex. 1007 at 385; see also Ex. 1003, ¶¶ 383-389.*) This is what the NDEF records are: each includes a unit of information that when combined, form a complete message. For instance, in Figure 3B, one NDEF record includes the “AP/GO MAC address” and other record includes the “authentication information 25.” (*See Ex. 1005, Fig. 3B.*)

Further, Suumäki also “incorporate[s] ... by reference” “[t]he NFC Data Exchange Format (NDEF) specification,” which “defines common data format for NFC devices to exchange application or service specific data.” (*Ex. 1005, 20:20-*

24.) While this incorporation makes the specification part of Suumäki, even if this were not the case, the specification would inform a POSITA's understanding of Suumäki's teachings. (*See* Section X.B, *infra*.) This NDEF specification "defines a message encapsulation format to exchange information, *e.g.* between" two NFC devices. (Ex. 1008 at 1.) "NDEF is a lightweight, binary message format that can be used to encapsulate one or more application-defined payloads of arbitrary type and size into a single message construct." (*Id.*) Like Suumäki, the specification explains that an "NDEF message contains one or more NDEF records." (*Id.* at 5; *see also id.* at 8. Each record can include a "chunk" (*i.e.*, a portion of a larger piece of data). (*See id.* at 8-9.) Each also employs a "common format." (*Id.* at 14.) It starts with various flags, such as a "Message Begin" flag to indicate the "start of an NDEF message," a "Message End" flag to indicate the "end of an NDEF message," or a "Chunk Flag" indicating that the record is part of a chunk. (*Id.*) Then, among other things, it includes fields indicating the record length, type, identification, and payload. (*See id.* at 15-18.) An example of this is shown below:

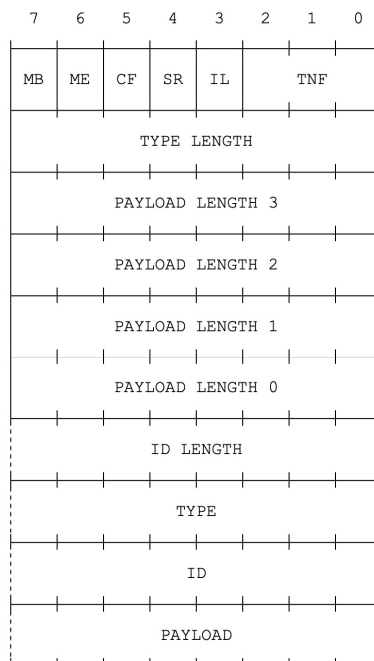


Figure 3. NDEF Record Layout

(*Id.* at 14.) This is no different than the '615 patent's example "packet." That packet, like the NDEF record shown above, includes various "fields," including a "header" that "may be employed as a start frame deliver" and identifies the "message type," along with various other pieces of information. (*See* Ex. 1001, 11:22-37; Fig. 8; *see also* Ex. 1003, ¶¶ 390-397.)

Other prior art confirms that messages transmitted between NFC devices constitute "packets." For instance, one reference explains that "[a] packet in ... NFC communication has a unit called an NDEF record...." (Ex. 1010, 11:60-65; *see also* Ex. 1009, Abstract (discussing "near field communication" "packets" at length); *see also* Ex. 1003, ¶¶ 398-399.).

[1-5], [11-5], [16-5] “executing an application on the target device to decode and process the one or more network configuration packets and recover the network configuration data; and”

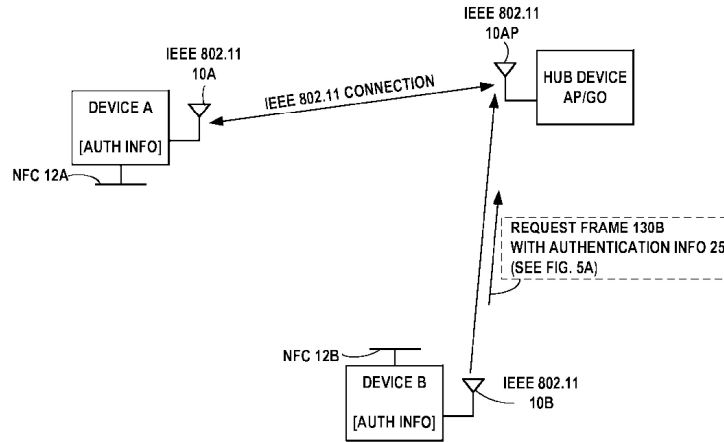
Suumäki explains that “the memory of device A and device B” include “programmed instructions of the NFC Connection Handover protocol ... implement[ed] as software....” (Ex. 1005, 24:33-38.) This program/software “carr[ies] out the functions of the disclosed embodiments” “when executed in the CPU.” (*Id.*, 24:45-49; *see also id.*, 28:51-59 (referencing “computer code instructions” that are “executed”).) Thus, Suumäki ***“execut[es] an application on the target device.”*** (See Ex. 1003, ¶¶ 400-403.)

Next, Suumäki explains that upon receipt of message 61, one of the functions carried out by the “NFC Connection Handover program” running on device B is to use the “connection parameters” the message contains “to setup an IEEE 802.11 in-band short-range carrier communication connection with the hub device....” (Ex. 1005, 22:1-13; *see also id.*, 27:17-21 (“After the NFC touch procedure, device B possesses the authentication information 25 recognizable by the hub device AP/GO, in its input/output buffer 17....”).) Because the parameters are extracted and used by device B for purposes of setting up a network connection, a POSITA would have understood that Suumäki ***“decode[s] and process[es] the one or more network configuration packets and recover[s] the network configuration data”*** as required. (See Ex. 1003, ¶¶ 404-405.)

This is confirmed by the NDEF specification. In particular, the specification explains that upon receipt, an “NDEF message” is “parsed” by an “NDEF parser” that “deconstructs the NDEF message and hands the payloads to a ... user application.” (Ex. 1008 at 7.) A POSITA would have understood that Suumäki operates in the same way: upon receipt of message 61, an application running on device B will parse the message, extract the network configuration information it contains, and use that information to establish a connection with the network hub. (See Ex. 1003, ¶¶ 406-409.)

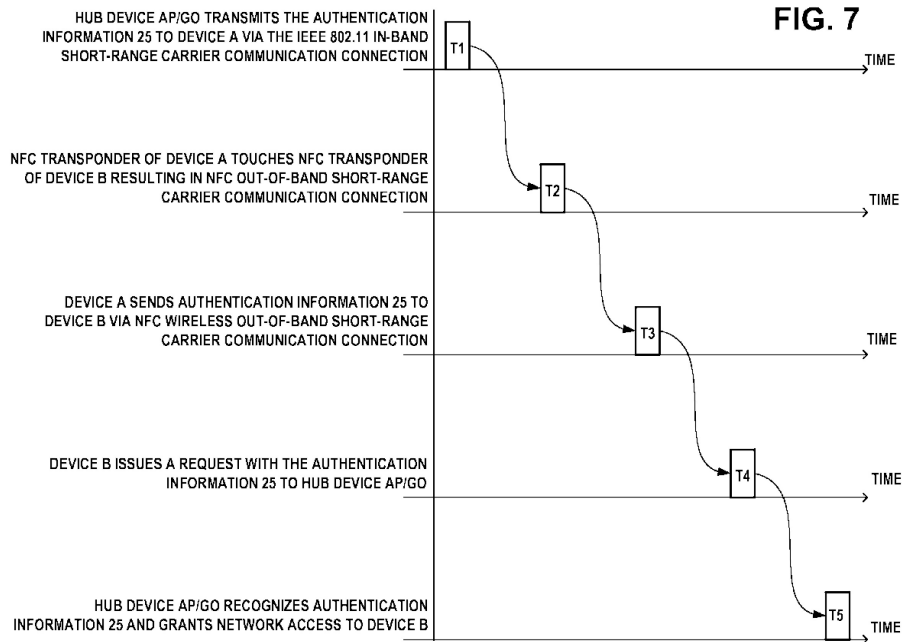
[1-6], [11-6], [16-6] “after receiving the network configuration packets, employing via the wireless radio the network configuration data conveyed in the one or more network configuration packets to enable the target device to join the communication network.”

In Suumäki, device B includes “one or more in-band short-range carrier transceivers” that allow it to engage in “IEEE 802.11 WLAN communications.” (Ex. 1005, 23:26-30, 47-50.) Upon receipt of NFC handover select message 61, device B uses the authentication and connection information the message contains “to setup an IEEE 802.11 in-band short-range carrier communication connection with the hub device” using this transceiver. (Ex. 1005, 22:1-13; *see also id.*, 27:17-21.) Figure 1G shows “device B” using its “IEEE 802.11” transceiver to wirelessly communicate with “hub device AP/GO”:



(*Id.*, Fig. 1G.) The purpose of this communication is to enable the connection of device B to the existing IEEE 802.11 network and “acquire credentials for network access, without requiring the user to type in a PIN number.” (*Id.*, 21:32-37; *see also id.*, 27:51-54.) The “authentication information” in the message 61 is relayed to the hub as part of this process to serve as “proof that the device B did, in fact engage in an NFC touch with device A.” (*Id.*, 21:60-67.) The other information in the message “help[s] reduce delays in connection setup.” (*Id.*, 26:48-51.)

Figure 7 provides an overview:



(*Id.*, Fig. 7.) As shown, after receiving “authentication information 25” from device A over the NFC “communication connection,” device B “issues a request with the information 25 to hub device AP/GO.” Then, if the “hub device ... recognizes” the “authentication information 25,” it “grants network access to device B” in a final step by providing the device with “network credentials for the network.” (*Id.*; see also *id.*, 22:21-38.) This allows device B to be “connected to the network with its new configuration” such that it can “communicate with device A over the network, through the hub device.” (*Id.*, 22:39-45.) The successful addition of device B to the existing wireless network is shown in Figure 11:

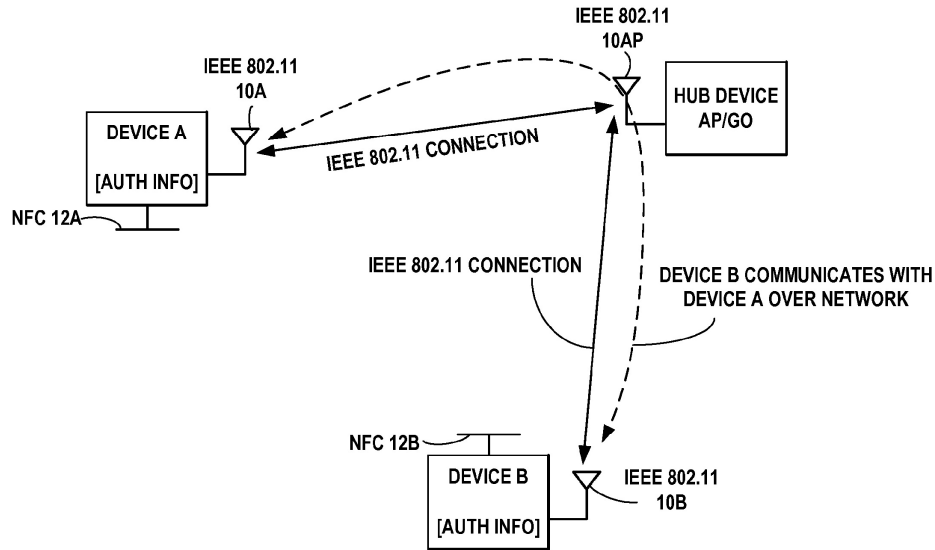


FIG. 1I

(*Id.*, Fig. 1I.)

Thus, Suumäki uses the “*network configuration data*” it received (the message 61) to engage in “*wireless*” communication (the communication with the hub device) for purposes of “*enabl[ing] the target device*” (device B) “*to join the communication network*” (completing the process of obtaining the required network credentials for device B). (*See* Ex. 1003, ¶¶ 410-420.)

2. Claim 2

“2. The method of claim 1, wherein the wireless device is selected from a group consisting of a smartphone and a tablet computer.”

This is rendered obvious by Suumäki. According to Suumäki, device A (the claimed “*wireless device*”) can be a “cellular telephone, PDA, laptop computer,” “palmtop computer,” “and the like.” (Ex. 1005, 20:51-54, 23:32-36.) At the time

the '615 patent was filed, both smartphones and tablet computers were well known and in routine use. (See Ex. 1003, ¶¶ 424-425; *see also* Ex. 1011, ¶¶ [0031], [0041].) Given this, a POSITA would have immediately recognized and considered it highly obvious that Suumäki's reference to telephones, PDAs, laptops, and palmtops also embraces such devices. (See Ex. 1003, ¶¶ 421-427.)

3. Claim 3

“3. The method of claim 1, wherein information received via the short-range signal transmission path is received at a first wireless radio of the target device, and the first wireless radio employs at least one of a plurality of radio modulation techniques including frequency shift keying (FSK), phase shift keying (PSK), on-off keying (OOK), and quadrature amplitude modulation (QAM).”

This is also taught by Suumäki. In particular, Suumäki explains that its device B—the claimed ***“target device”***—is “equipped with an out-of-band NFC transceiver ... using the Near Field Communication (NFC) protocol.” (Ex. 1005, 23:22-25; *see also* Figs. 1-2.) This NFC transceiver is the claimed ***“first wireless radio of the target device.”*** (See Ex. 1003, ¶¶ 428-431.)

Suumäki also explains that upon occurrence of an NFC touch event between devices A and B, an “NFC communication link” is created allowing for the transmission of information back and forth. (Ex. 1005, 24:65-25:1; *see also id.*, 18:67-19:3; 21:31-44; Fig. 1D.) Thus, Suumäki's NFC transceiver allows ***“information”*** to be ***“received via the short-range signal transmission path.”*** (See Ex. 1003, ¶¶ 432-433.)

Moreover, according to Suumäki, “[t]he ISO/IEC 18092 standard specifies modulation schemes, codings, transfer speeds and frame format” employed during NFC communication. (Ex. 1005, 19:39-45.) This standard is incorporated by reference and thus is part of Suumäki. (*See id.*, 33:58-61.) The standard explains that NFC devices employ various “modulation schemes” when communicating. (Ex. 1012 at 6.) In particular, both a sending and receiving device “shall use the modulation principle of ASK 100% of the RF operating field to create a ‘Pulse’....” (*Id.* at 7.) A POSITA would consider this reference to ASK modulation to embrace “*on-off keying (OOK)*,” one of the permitted modulation techniques identified by this claim. (*See* Ex. 1003, ¶¶ 434-442; *see also* Ex. 1013, 10:38-40 (“The simplest form of ASK for binary data communication is on-off keying (OOK)...”).)

Even if Suumäki had not incorporated the ISO/IEC 18092 standard, a POSITA would have considered it highly obvious to employ it. Suumäki explains that this standard sets forth a “protocol” for “data exchange” and is “required for data collision control.” (Ex. 1005, 19:43-48.) This would have provided a strong motivation for the use of the standard when implementing Suumäki’s system and method. (*See* Ex. 1003, ¶¶ 443-445.)

4. Claim 5

“5. The method of claim 1, wherein the short-range signal transmission path is associated with a communication channel based on one of Bluetooth communication, radio frequency identification (RFID), Zigbee, radio frequency for consumer electronics (RF4CE), Z-Wave, and near field communication.”

This is taught by Suumäki. Suumäki explains that the “wireless out-of-band carrier” used to transmit network connection information from device A to device B “is one of Near Field Communication” or “Radio Frequency Identification.” (Ex. 1005, 3:27-31; *see also id.*, 21:40-44; Ex. 1003, ¶¶ 446-448.)

5. Claim 6

“6. The method of claim 1, further comprising: contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.”

While Suumäki discusses the use of a NFC communication link between devices A and B to transmit network configuration information, it also teaches that “hub device AP/GO may” itself “be equipped with an out-of-band NFC transceiver and an implementation supporting the Near Field Communication (NFC) protocol.” (Ex. 1005, 24:39-42.) In view of this, a POSITA would understand that the process of adding device B to an existing network could be initiated by performing a touch event between device B and the hub. (*See* Ex. 1003, ¶¶ 449-457; *see also* Ex. 1005, 19:15-19 (“[T]he user” may “bring[] the NFC radio on the device close to an access point (AP) ... to allow near field communication”).) In such circumstances, the hub—and not device A—would use the created NFC communication link to transmit

the “NFC handover select message 61” including communications and authentication information to device B. (See Ex. 1003, ¶¶ 456-457.) This message would be transmitted in the same way and would include the same types of information discussed above. (See *supra* Section X.A.1.)

After performance of this NFC touch and transmission of the message 61, “[d]evice B issues a request frame” and sends to the “hub device AP/GO in a Wi-Fi Protected Setup procedure.” (Ex. 1005, 27:22-25; *see also id.*, 22:14-20.) This frame is transmitted wirelessly and employs an IEEE 802.11 standard format. (See *id.*, 27:55-59; *see also id.*, 13:16-48 (“Wi-Fi Protected Setup” employs “in-band ... messages”).) It also includes “the authentication information 25 recognizable by the hub device” that “serve[s] as proof that the device B did, in fact engage in an NFC touch....” (*Id.*, 27:25-30, 34-36.) In such circumstances, device B is “**contacting the wireless device**” (the same hub with which it engaged in NFC communication). And, by sending back the authentication information it previously received, it “**indicate[s] that**” it “**has successfully entered the communication network.**” (See Ex. 1003, ¶¶ 458-462.) Moreover, Suumäki also explains that an “Enrollee” device can transmit a “WSC_Done message” once it processed any received network credentials. (Ex. 1005, 14:59-64; *see also* Ex. 1003, ¶ 463.)

6. Claim 7

“7. The method of claim 6, further comprising: after contacting the wireless device, continuing the commission process, including receiving, via the communication network, device configuration data from the wireless device.”

This is also taught by Suumäki. Again, as discussed above in connection with claim 6, a POSITA would recognize that hub device AP/GO could also include an NFC transceiver thus making it the claimed **“wireless device.”** Moreover, after performance of an NFC touch event and the hub is contacted by device B and “recognize[s] the authentication information,” “hub device AP/GO will grant network access to device B.” (Ex. 1005, 27:34-40.) This entails “exchang[ing]” further in-band 802.11 messages “to provision device B with network credentials 28 for the network.” (*Id.*, 27:35-46.) “Fig. 5B illustrates an example ... frame ... sent by the hub device AP/GO to the device B with the ... information elements used to assemble credentials 28 in device B.” (*Id.*, 28:9-19; Fig. 5B.) These received credentials are the claimed **“device configuration data.”** (Ex. 1003, ¶¶ 464-470.) And because these credentials are transmitted as part of the process for device B to successfully communicate on the network, their receipt is part of **“continuing the commissioning process.”** (*Id.*, ¶ 470.)

7. Claim 8

“8. The method of claim 7, wherein the device configuration data including at least one of an Internet Protocol address, proxy, and gateway configuration.”

As shown in Figure 5B of Suumäki, the frame sent from the hub to device B to complete the network commissioning process includes a “source address” 534, “destination address” 535, and various other network information (Ex. 1005, Fig. 5B; 15:48-16:18.) A POSITA would have understood that this address information includes any of the information the claim here requires, including an IP address, a proxy, or a gateway configuration. (*See, e.g., id.*, 26:41-42 (explaining that “client identity information” can be in the form of an “IP address”); *see also* Ex. 1003, ¶¶ 471-476.)

8. Claim 9

“9. The method of claim 1, further comprising: generating one of a visual indication and an audio indication to a user about a status of the commissioning process.”

Suumäki indicates that its devices can include a “display,” “speaker,” or other output device. (Ex. 1005, 23:33-45.) Further, Suumäki explains that once it performs an NFC touch event and has been authenticated by the hub, “device B” will be “connected to the network with its new configuration and may communicate with device A over the network, through the hub device AP/GO.” (*Id.*, 22:39-45.) A POSITA would have understood that now-connected status would be indicated the user—via a status icon or some other means—on the device’s display. (*See* Ex.

1003, ¶¶ 477-480.) Suumäki also explains that a “EAP-Failure message” may be sent to a device in the event it is unable to successfully complete the steps needed to join a network. (Ex. 1005, 15:5-12; *see also id.*, 18:38-49.) A POSITA would have considered it obvious that this would similarly be displayed to the user either via a message, or another status icon indicating that there is no network connection. (*See* Ex. 1003, ¶¶ 481-484.)

9. Claim 10

“10. The method of claim 1, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Suumäki for the same reasons discussed for limitation [1-1]: Suumäki employs “program logic” and executed “instructions” to carry out its connection setup method. (*See supra* Section X.A.1.[1-1]; Ex. 1003, ¶485.)

10. Claim 12

“12. The target device of claim 11, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Suumäki for the same reasons discussed for claim 10. (*See supra* Section X.A.9; Ex. 1003, ¶ 486.)

11. Claim 15

“15. The target device of claim 11, wherein the communication network includes a wireless local area network (WLAN).”

This is taught by Suumäki: the network joined by the new device can be an “IEEE 802.11 wireless local area network (WLAN)....” (Ex. 1005, 1:39-51; *see also id.*, 3:32-40; Ex. 1003, ¶¶ 487-489.)

12. Claim 17

“17. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for: generating one of a visual indication and an audio indication to a user about a status of the commissioning process.”

This is taught by Suumäki for the same reasons discussed for claim 9. (*See supra* Section X.A.8; Ex. 1003, ¶ 490.)

13. Claim 18

“18. The non-transitory computer readable storage medium of claim 16, further comprising an application that includes a sequence of program instructions directed towards commissioning the target device onto the communication network.”

This is taught by Suumäki for the same reasons discussed for claim 10. (*See supra* Section X.A.9; Ex. 1003, ¶ 491.)

14. Claim 19

“19. The non-transitory computer readable storage medium of claim 16, wherein the one or more programs further comprise instructions for: contacting the wireless device via the communication network to indicate that the target device has successfully entered the communication network.”

This is taught by Suumäki for the same reasons discussed for claim 6. (*See supra* Section X.A.5; Ex. 1003, ¶ 492.)

B. Motivation to Combine

While the above discussion of Suumäki refers, in some cases, to different embodiments, a POSITA would have been motivated to use these embodiments together and would have expected to succeed when doing so. (*See* Ex. 1003, ¶¶ 493-505.) Indeed, Suumäki itself says as much explaining that its system has broad, flexible applicability. It allows for the use of many different communication methods (*e.g.*, Ex. 1005: 3:27-50), network commissioning functionality that can be alternatively implemented in either hardware or software (*e.g.*, *id.*, 24:43-58), and the transmission of various different types of network information from one device to another (*e.g.*, *id.*, 3:20-21, 25:60-46, 29:62-30:24).

Suumäki also cites to—and incorporates by reference—several communication standards. (*See, e.g.*, Ex. 1005, 20:20-22 (incorporating Ex. 1008); Ex. 1005, 19:24-26, 33:58-61 (incorporating Ex. 1012).) To the extent it is determined that these standards were not properly incorporated into Suumäki’s specification, a POSITA would nonetheless have been motivated and considered it

obvious to use them. (*See* Ex. 1003, ¶¶ 500-505.) Suumäki itself repeatedly references and contemplates the use of the standards. (*See, e.g.*, Ex. 1005, 19:32-35 (noting that the “NFC Forum” has “defined” aspects of the NFC data transmission format in an “NDEF” specification); 19:39-48 (explaining that the ISO/IEC 18092 standard “defines” various aspects of NFC communication).) Moreover, the standards relate to, among other things, the operation of NFC devices. (*See generally* Exs. 1008, 1012.) Suumäki employs NFC to transmit network configuration information. (*See* Ex. 1005, 3:27-31.) A POSITA would recognize that use of the standards would ensure that Suumäki’s system is compatible and can be used with the types of NFC hardware present in commercially available devices. (*See* Ex. 1003, ¶ 505.)

XI. Conclusion

For the foregoing reasons, Petitioner respectfully requests institution of IPR and cancellation of claims 1-3, 5-12, and 15-19

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing PETITION FOR *INTER PARTES* REVIEW complies with the type volume limitation in 37 C.F.R. § 42.24(a)(1). According to the utilized word-processing system's word count, the petition—excluding the caption, table of contents, table of exhibits, mandatory notices, certificate of word count, and certificate of service—contains 13,983 words.

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CERTIFICATE OF SERVICE

The undersigned hereby confirms that the foregoing PETITION FOR IPR and associated exhibits were caused to be served on April 5, 2023 via overnight courier upon the following counsel of record for Patent Owner:

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