

# EXHIBIT 15



(12) **United States Patent**  
**Vleugels et al.**

(10) **Patent No.:** **US 10,873,906 B2**  
(45) **Date of Patent:** **Dec. 22, 2020**

(54) **APPARATUS AND METHOD FOR INTEGRATING SHORT-RANGE WIRELESS PERSONAL AREA NETWORKS FOR A WIRELESS LOCAL AREA NETWORK INFRASTRUCTURE**

(71) Applicant: **Ozmo Licensing LLC**, Round Rock, TX (US)

(72) Inventors: **Katelijin Vleugels**, Palo Alto, CA (US); **Roel Peeters**, Palo Alto, CA (US)

(73) Assignee: **Ozmo Licensing LLC**, Round Rock, TX (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **16/912,262**

(22) Filed: **Jun. 25, 2020**

(65) **Prior Publication Data**

US 2020/0329429 A1 Oct. 15, 2020

**Related U.S. Application Data**

(60) Continuation of application No. 16/668,999, filed on Oct. 30, 2019, which is a continuation of application (Continued)

(51) **Int. Cl.**  
**H04W 52/02** (2009.01)  
**H04W 76/14** (2018.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04W 52/0212** (2013.01); **H04W 28/06** (2013.01); **H04W 52/0216** (2013.01);  
(Continued)

(58) **Field of Classification Search**  
CPC ..... H04W 76/14; H04W 28/06; H04W 52/02; H04W 80/04; H04W 84/10; H04W 84/12; H04W 88/08; H04W 88/085  
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,546,253 B1 \* 4/2003 Chow ..... H04M 15/00 455/406  
6,771,933 B1 \* 8/2004 Eng ..... H04W 88/085 370/338

(Continued)

FOREIGN PATENT DOCUMENTS

WO 03/105418 12/2003

OTHER PUBLICATIONS

Cordeiro, et al., "BlueStar: Enabling Efficient Integration between Bluetooth WPANs and IEEE 802.11 WLANs" Mobile Networks and Applications, 9, 409-422, 2004 —.

(Continued)

*Primary Examiner* — Jae Y Lee

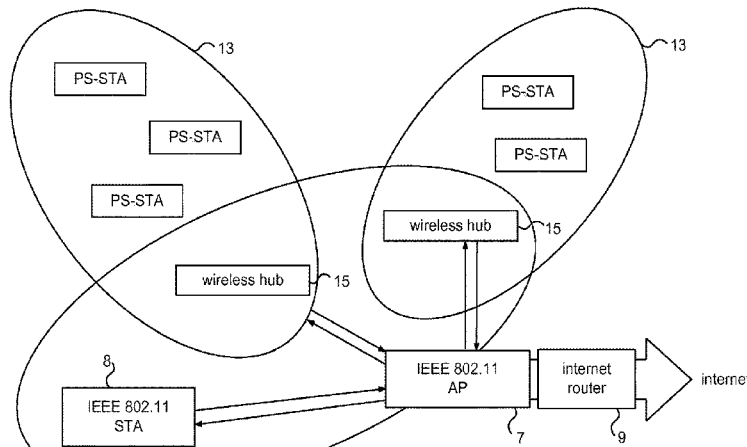
*Assistant Examiner* — Jean F Voltaire

(74) *Attorney, Agent, or Firm* — Prince Lobel Tye LLP

(57) **ABSTRACT**

A network system comprises a first logic block providing a link to a first network via an access point of a WLAN and a second logic block communicating with a node of a second network (such as a WPAN) and configured to provide a link between the node and the first network via the access point. The network system is configured to maintain continuous connections to both the access point and the node while receiving power. The second logic block can communicate with the node using a modified communication protocol that is only partially compliant with an 802.11x communications protocol. A wireless hub can integrate a WPAN with a WLAN including, in part, a wireless circuit compliant with the WLAN standard (such as an 802.11x standard), a processor, and a memory. The wireless circuit can connect to the WPAN without losing connectivity (such as association and synchronization) to the WLAN.

**12 Claims, 12 Drawing Sheets**



**Related U.S. Application Data**

No. 14/990,203, filed on Jan. 7, 2016, now abandoned, which is a continuation of application No. 14/073,260, filed on Nov. 6, 2013, now Pat. No. 9,264,991, which is a continuation of application No. 13/560,917, filed on Jul. 27, 2012, now Pat. No. 8,599,814, which is a continuation of application No. 12/892,825, filed on Sep. 28, 2010, now abandoned, which is a division of application No. 11/422,945, filed on Jun. 8, 2006, now Pat. No. 7,826,408, which is a continuation of application No. 11/376,729, filed on Mar. 14, 2006, now abandoned.

(60) Provisional application No. 60/661,763, filed on Mar. 14, 2005.

(51) **Int. Cl.**

*H04W 80/04* (2009.01)  
*H04W 28/06* (2009.01)  
*H04W 84/10* (2009.01)  
*H04W 84/12* (2009.01)  
*H04W 88/08* (2009.01)  
*H04W 88/06* (2009.01)  
*H04L 29/06* (2006.01)  
*H04L 29/08* (2006.01)

(52) **U.S. Cl.**

CPC ..... *H04W 52/0219* (2013.01); *H04W 76/14* (2018.02); *H04W 80/04* (2013.01); *H04W 84/10* (2013.01); *H04W 84/12* (2013.01); *H04W 88/08* (2013.01); *H04W 88/085* (2013.01); *H04L 29/06* (2013.01); *H04L 63/08* (2013.01); *H04L 67/02* (2013.01); *H04L 67/10* (2013.01); *H04W 88/06* (2013.01); *Y02D 30/70* (2020.08)

(58) **Field of Classification Search**

USPC ..... 370/331  
 See application file for complete search history.

(56)

**References Cited**

U.S. PATENT DOCUMENTS

7,050,452 B2	5/2006	Sugar et al.	
7,194,263 B2	3/2007	Bahl et al.	
7,286,513 B2 *	10/2007	Nguyen	H04W 92/00 370/338
7,720,045 B2	5/2010	Bahl et al.	
2003/0119527 A1 *	6/2003	Labun	H04W 28/06 455/456.1
2003/0152110 A1 *	8/2003	Rune	H04J 3/0682 370/509
2006/0015621 A1 *	1/2006	Quinn	H04W 88/06 709/227

OTHER PUBLICATIONS

Rao, et al., "An Overlay Mac Layer for 802.11 Networks", Report No. UCB/CSD-4-1317, Computer Science Division (EECS) University of California, Berkley, Apr. 2004.  
 Chandra, et al., "MultiNet: Connecting to Multiple IEEE 802.11 Networks Using a Single Wireless Card".  
 Pung, et al., "Effects of window flow control on the 802.2 Type-III logical link performance in ArbNet", computer communications, vol. 16, No. 7, Jul. 7, 1993, pp. 403-412.  
 Srisathapornphat, et al., "Coordinated Power Conservation for Ad hoc Networks", IEEE, 2002, pp. 3330-3335.  
 Ye, et al., "An Energy-Efficient Mac Protocol for Wireless Sensor Networks", IEEE Infocom 2002, pp. 1-10.

\* cited by examiner

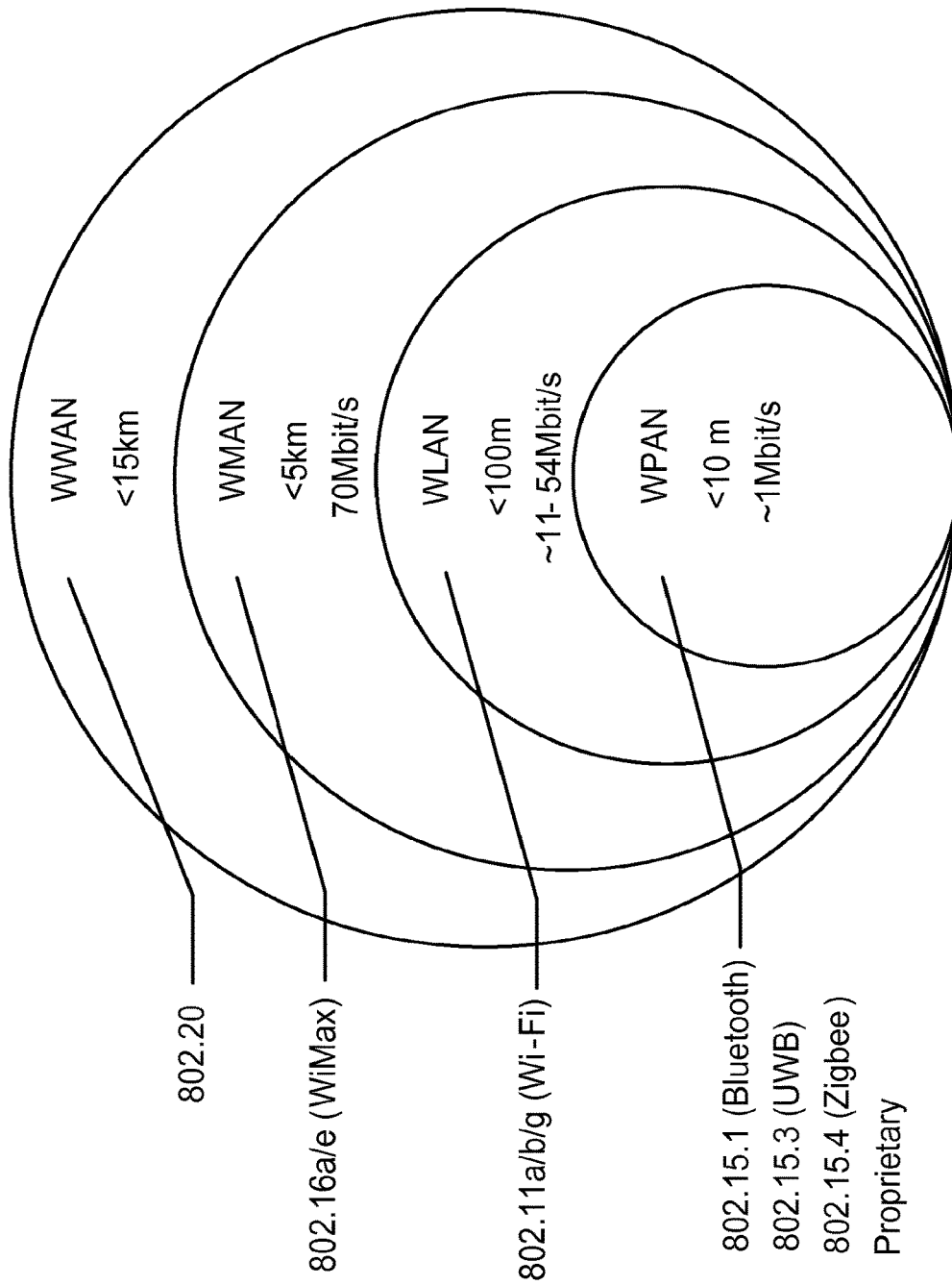


FIG. 1

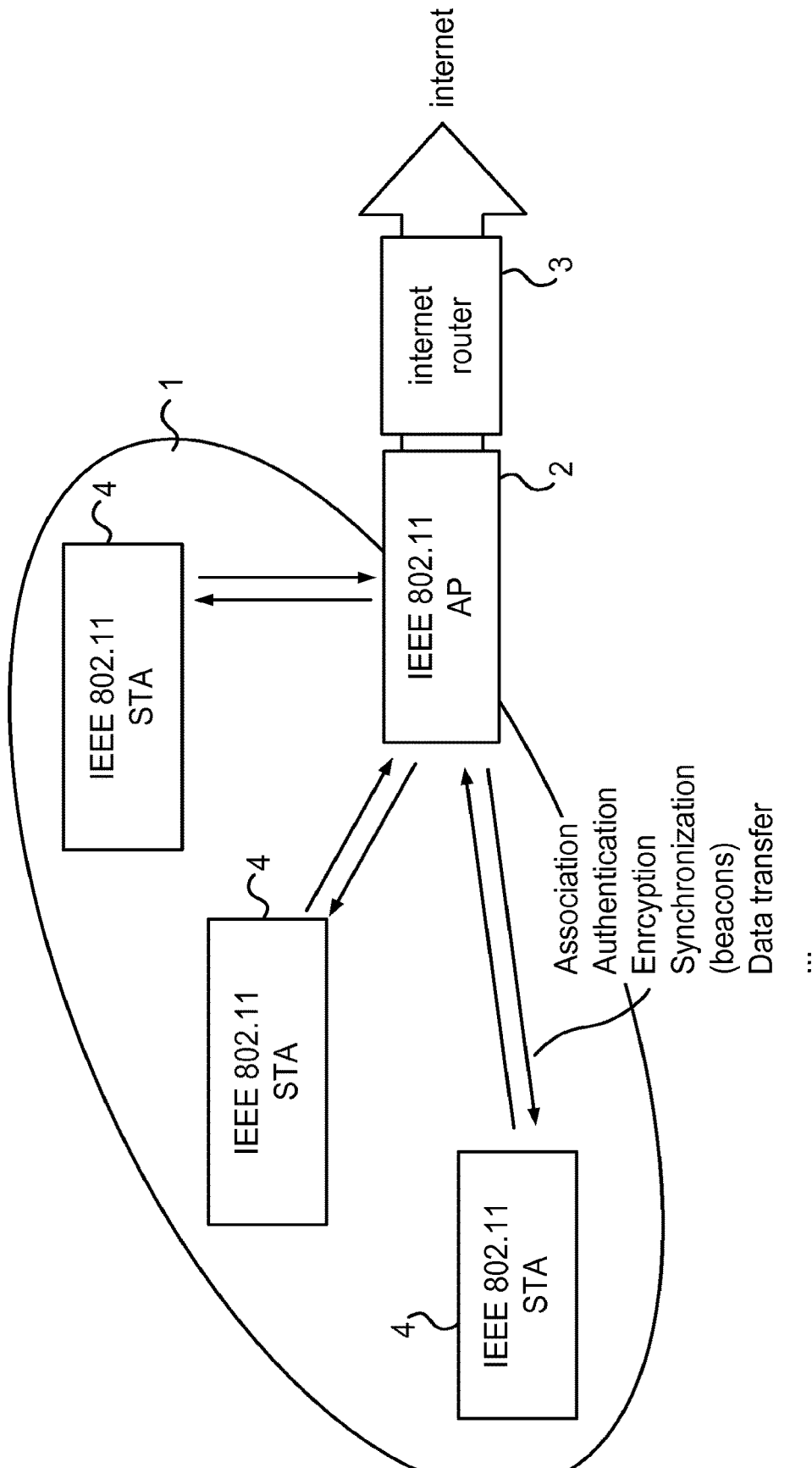


FIG. 2

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.