

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of:	Geonjung Ko, et al.	Attorney Docket No. 39843-0197IP1
U.S. Patent No.:	11,700,597	
Issue Date:	July 11, 2023	
Appl. Serial No.:	17/227,289	
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Title:	WIRELESS COMMUNICATION METHOD AND WIRELESS COMMUNICATION TERMINAL IN BASIC SERVICE SET OVERLAPPING WITH ANOTHER BASIC SERVICE SET	

SUPPLEMENTAL DECLARATION OF EXPERT

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true, and further, that these statements were made with the knowledge that willful false statements and the like so made are punishable under Section 1001 of Title 18 of the United States Code.

Date: 5/22/26

By: 
Dr. Mark P. Mahon

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I. ASSIGNMENT

1. I have been retained on behalf of Samsung Electronics Co., Ltd. (“Samsung”) to offer technical opinions related to U.S. Patent No. 11,700,597 (“the ’597 patent”) (SAMSUNG-1001).

2. I have been asked to provide my independent analysis of the ’597 patent based on the prior art publications cited in this declaration.

3. I previously submitted an expert declaration with technical opinions related to the ’597 patent in support of Samsung’s petition for *inter partes* review. SAMSUNG-1003. I understand that this supplemental declaration will be submitted in support of Samsung’s petitioner reply.

4. I am not and never have been, an employee of Samsung. I received no compensation for this declaration beyond my normal hourly compensation based on my time actually spent analyzing the ’597 patent, the prior art publications cited below, and issues related thereto, and I will not receive any added compensation based on the outcome of any IPR or other proceeding involving the ’597 patent.

II. QUALIFICATIONS AND BACKGROUND INFORMATION

5. I incorporate by reference here my discussion of my qualifications and background information from my previous expert declaration, which was submitted in support of Samsung’s petition for *inter partes* review for the ’597 patent. SAMSUNG-1003, pp. 4-15.

III. OVERVIEW OF CONCLUSIONS FORMED

6. I incorporate by reference here my discussion of my conclusions regarding the '597 patent from my previous expert declaration, which was submitted in support of Samsung's petition for *inter partes* review for the '597 patent. SAMSUNG-1003, pp. 15-16.

IV. LEVEL OF ORDINARY SKILL IN THE ART

7. I incorporate by reference here my discussion of the applicable level of ordinary skill in the art from my previous expert declaration, which was submitted in support of Samsung's petition for *inter partes* review for the '597 patent. SAMSUNG-1003, pp. 16-17.

V. LEGAL STANDARDS

8. I incorporate by reference here my discussion of the applicable legal standards from my previous expert declaration, which was submitted in support of Samsung's petition for *inter partes* review for the '597 patent. SAMSUNG-1003, pp. 17-23.

VI. MATERIALS CONSIDERED

9. I incorporate by reference here my discussion of materials considered from my previous expert declaration, which was submitted in support of Samsung's petition for *inter partes* review for the '597 patent. SAMSUNG-1003, pp. 23-24.

10. In addition, I considered the following additional materials in rendering the opinions contained within this declaration:

- IPR2025-00936, Paper 13, Institution Decision;
- IPR2025-00936, Paper 24, Patent Owner Response;
- April 13, 2026 Deposition Transcript of Todor V. Cooklev, Ph.D.;
- Declaration of Todor V. Cooklev, Ph.D.;
- Dictionary of Computer and Internet Terms (Vol. 1) (1st ed. 2016);
- The American Heritage Dictionary of the English Language (5th ed. 2016);
- U.S. Pat. App. Pub. No. 2018/0270038 (“Oteri”);
- U.S. Pat. No. 9,942,193 (“Chu”);
- U.S. Pat. No. 10,136,349 (“Yang”)

VII. TECHNOLOGY OVERVIEW

11. I incorporate by reference here my technology overview discussion from my previous expert declaration, which was submitted in support of Samsung’s petition for *inter partes* review for the ’597 patent. SAMSUNG-1003, pp. 24-33.

VIII. THE ’597 PATENT

12. I incorporate by reference here my overview discussion of the ’597 patent from my previous expert declaration, which was submitted in support of Samsung’s petition for *inter partes* review for the ’597 patent. SAMSUNG-1003,

p. 33.

IX. OVERVIEW AND COMBINATIONS OF PRIOR ART REFERENCES

13. I incorporate by reference here my overview discussion of the Lee, Stacey, Zhou, and Choudhury prior art references, as well as the relevant combinations, from my previous expert declaration, which was submitted in support of Samsung's petition for *inter partes* review for the '597 patent. SAMSUNG-1003, pp. 33-40.

X. Ground 1A: Lee renders claims 1, 7, 9, and 15 obvious

14. I understand that Dr. Cooklev alleges that the Petition failed to show that limitations [1.4] and [9.3] are met by Lee. Ex. 2016, ¶¶40-48. Specifically, I understand that Dr. Cooklev asserts that Lee does not teach that any BSS color operations other than CCA level change would be prevented by receipt of a "coloring disable bit." *Id.*, ¶¶41-43. For example, Dr. Cooklev states in his declaration that "[t]here is nothing in Lee that prevents the coloring bit from being used for other types of operations" and that Lee "*at very least* leaves open the *possibility* that the processor could continue to use BSS color for other operations." *Id.*, ¶42. I understand that Dr. Cooklev raised NAV operations and power save operations as specific examples of BSS color-based operations allegedly not addressed in the Petition's independent claim analysis for Lee. *Id.*, ¶42.

15. I disagree with Dr. Cooklev. The '597 patent's independent claims

require “not using a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed....” SAMSUNG-1001, cl. 9; *see also id.* cl. 1. A POSITA would not have understood the claims to require a specific set of BSS color-based operations, as no such operations are listed in the independent claims. *Id.*, cls. 1, 9. Lee details three embodiments of its invention: Embodiment 1 is detailed at paragraphs [0067] to [0075], Embodiment 2 is detailed at paragraphs [0076] to [0080], and Embodiment 3 is detailed at paragraphs [0081] to [0088]. SAMSUNG-1005, [0067]-[0080]. Lee makes no mention of “power save” operations, and its only passing references to NAV functionality appear in its discussion of Embodiment 3. SAMSUNG-1005, [0084], [0086].

16. In my previous expert declaration, which was submitted in support of the Petition, I relied upon disclosures from Lee’s discussion of Embodiment 1 in my analysis of claim limitations [1.4] and [9.3]. SAMSUNG-1003, ¶¶86-89, 100. Lee’s Embodiment 1 makes no mention of BSS color-based NAV operations or power save operations. SAMSUNG-1005, [0067]-[0075]. Lee’s Embodiment 1 describes a system that performs BSS color-based CCA level change and spatial reuse operations. *Id.* Lee’s Embodiment 1 further describes how these operations are not performed upon receipt of Lee’s “coloring disable bit.” SAMSUNG-1005, [0068]-[0070]; *see also* SAMSUNG-1003, ¶¶86-89, 100. Indeed, Embodiment 1

describes using the COLOR field *only* when no “coloring disable bit” is received.

SAMSUNG-1005, [0068], [0071], [0072]. A POSITA would therefore have understood that Lee’s Embodiment 1 discloses “not using a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed....” SAMSUNG-1001, cl. 9; *see also id.*, cl. 1.

17. Moreover, even if Lee’s device did include additional BSS color-based operations, a POSITA would have understood and found obvious that Lee’s “coloring disable bit” disables color/coloring functionality in Lee’s Embodiment 1. A POSITA would have further understood that this “disabling” may be partial or full disablement. SAMSUNG-1026, 160 (defining “disable” as “[t]o make a ... component, or feature nonfunctional.”); SAMSUNG-1027, 513 (defining “disabled” as “[i]noperative: a disabled vehicle”). A POSITA would have considered, from Lee’s use of the term “disable” to describe its coloring disable bit, that BSS color is nonfunctional or inoperative when the coloring disable bit is received. SAMSUNG-1026, 160; SAMSUNG-1027, 513. With BSS color being nonfunctional or inoperative, a POSITA would have understood and found obvious that BSS color is not used in Lee’s Embodiment 1 when the coloring disable bit is received.

XI. Ground 1B: Lee-Stacey renders claims 2-3, 6, 10-11, and 14 obvious

18. I understand that Dr. Cooklev asserts that the Petition fails to show that a POSITA would have found it obvious to disable all BSS color-based operations in response to BSS color collisions. Ex. 2016, ¶¶58-66. Specifically, I understand that Dr. Cooklev suggests that a POSITA would not have understood BSS color collisions “to be a sufficiently common occurrence” for it to have been obvious to a POSITA to design a system that disables color operations. Ex. 2016, ¶59.

19. I disagree with Dr. Cooklev. The Stacey reference states that the number of possible BSS color values from which an AP may select are “1 to TBD.” SAMSUNG-1006, 51. In my opinion, a POSITA would have understood from this disclosure that the ultimate number of BSS colors could be quite small (*e.g.*, 2 or 4) such that BSS color collisions are a common occurrence.

20. Additionally, prior art cited in my prior declaration shows that BSS color collisions were known in the art at the time of the ’597 patent. Specifically, Zhou teaches a “wireless system” that “may detect that two BSSs are associated with a color collision.” SAMSUNG-1007, [0005]; SAMSUNG-1008, [0004]. In Zhou, a color collision occurs when “the two BSSs are using the same color bits.” SAMSUNG-1007, [0005]; SAMSUNG-1008, [0004]. Zhou’s teachings are discussed in greater detail in my previous declaration and in the Petition. Petition, 31-37, 72-76; SAMSUNG-1003, ¶¶80-81, 132-143, 225-236. I understand that Dr.

Cooklev did not challenge my characterization of the Zhou reference in my previous declaration. Zhou shows that those of ordinary skill in the art at the relevant time were aware of BSS color collisions and would have been motivated to develop solutions addressing BSS color collisions. This fact is corroborated by other references that are prior art to the '597 patent or were filed in the relevant timeframe. SAMSUNG-1028, [0164]-[0166] (describing how a STA can discover that another BSS “may be using the same color” as its BSS and how a STA may select a new BSS color in response); SAMSUNG-1029, 10:58-11:56 (describing a device that detects “color collisions” and initiates a BSS color change in response); SAMSUNG-1030, 7:61-9:57 (describing the effects of “BSS Color collision[s]” and discussing solutions).

21. As I explained in my previous declaration, a POSITA would have found it obvious to leverage Lee’s “coloring disable bit” to disable all BSS color use, including BSS color use for the NAV and power save functionality described in Stacey. SAMSUNG-1003, ¶¶104-109. Indeed, a POSITA would have understood that the “disablement” stemming from Lee’s “coloring disable bit” could be either partial or full disablement and that BSS color is nonfunctional or inoperative when the coloring disable bit is received. SAMSUNG-1026, 160 (defining “disable” as “[t]o make a ... component, or feature nonfunctional.”); SAMSUNG-1027, 513 (defining “disabled” as “[i]noperative: a disabled vehicle”).

For the reasons discussed in my previous declaration, a POSITA would have found it obvious to fully disable BSS color use in response to BSS color collisions.

SAMSUNG-1003, ¶¶104-109.

XII. Ground 2A: Choudhury renders claims 1, 7, 8, 9, 15, and 16 obvious

22. I understand that Dr. Cooklev argues that Choudhury’s “Low Power/High Interference” indicator does not satisfy the requirement of “not using a Basic Service Set (BSS) color indicated by the PPDU when signaling information indicates that an operation based on the BSS color is not allowed....” SAMSUNG-1001, cl.9; *see also id.*, cl.1. Specifically, I understand that Dr. Cooklev asserts that “Choudhury *does* determine whether to allow channel access by looking at the received BSS color even when the Low Power Indicator is set to 1.” Ex. 2016, ¶72.

23. Choudhury discloses that the COLOR field is not used when the “Low Power/High Interference” indicator is set to 1. For example, the following table from Choudhury shows that the Choudhury device always “Limit[s] Access” when the “Low Power/High Interference” indicator is set to 1:

COLOR Field	Low Power/High Interference Indicator	Receiving STA
Not used	1	Limit Access
Not used	0	Allow Access
STA in same BSS (that is, same COLOR field as receiving STA)	0 or 1	Limit Access
STA in different BSS (different COLOR field from receiving STA)	0	Allow Access
STA in different BSS (different COLOR field from receiving STA)	1	Limit Access

SAMSUNG-1009, [0029].

24. To the extent Dr. Cooklev argues that checking the “Low Power/High Interference” indicator before the COLOR field is not disclosed by Choudhury, a POSITA would have found it obvious to check Choudhury’s “Low Power/High Interference” indicator first and, if the indicator is set to 1, not check the COLOR field. For example, Choudhury describes using the three bits of the COLOR field to signal Basic Service Set identification, whereas the “Low Power/High Interference” indicator is represented by a single bit. SAMSUNG-1009, [0029]. A POSITA would have understood that it would be more efficient to read the value of the single-bit “Low Power/High Interference” indicator first and only read the three-bit COLOR value after determining that the “Low Power/High Interference” indicator has a value of zero. A POSITA also would have found this arrangement obvious to try, as there are only two alternatives: (1) check the “Low Power/High Interference” indicator first and the COLOR field second, or (2) check the COLOR field first and the “Low Power/High Interference” indicator second. *Id.*, [0029]. The order of checking the “Low Power/High Interference” indicator and the COLOR field does not change the functionality of Choudhury’s device and a POSITA would have found the order to be a minor implementation detail that would have been obvious to adjust. Moreover, a POSITA implementing the Choudhury device according to this arrangement would have enjoyed a reasonable

expectation of success in doing so because changing the order in which the Choudhury device checks the “Low Power/High Interference” indicator and the COLOR field would require minor software changes that would be well within the knowledge of a POSITA as of the relevant time.

25. I also understand that Dr. Cooklev argues that Choudhury’s teachings of using a COLOR value of “0000” fail to render the independent claims obvious because reading and evaluating the COLOR value of “0000” is itself a “use” of BSS color. Ex. 2016, ¶82.

26. I disagree. A POSITA would have understood, from the ’597 patent’s dependent claims, that the claimed “signaling information indicating that an operation based on the BSS color is not allowed” can be a BSS color field with a “predetermined value” of zero. SAMSUNG-1001, cls. 1, 7, 8, 9, 15, 16. This conclusion is confirmed by disclosures in the ’597 patent specification. *Id.*, 21:16-40. Additionally, a POSITA would have understood from the structure of the patent’s independent claims that the claimed device must determine whether the “signaling information” indicates “that an operation based on the BSS color is not allowed” in order to “not ... use a Basic Service Set (BSS) color” in response. *Id.*, cls. 1, 9. A POSITA would have therefore understood that, when the “signaling information” is a BSS color with a “predetermined value” of zero, determining whether the BSS color of a received PPDU is the “signaling information” of a

“predetermined value” is not a “use” of BSS color.

XIII. CONCLUSION

27. For all the reasons I have noted in my previous expert declaration and in the foregoing paragraphs, claims 1-16 of the '597 patent are obvious.

28. I currently hold the opinions expressed in this declaration. But my analysis may continue, and I may acquire additional information and/or attain supplemental insights that may result in added observations.