

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of

**CERTAIN SMART CEILING FANS,
COMPONENTS THEREOF, AND
ASSOCIATED SYSTEMS AND
SOFTWARE THEREOF**

Inv. No. 337-TA-1374

ORDER NO. 12: CONSTRUING TERMS OF THE ASSERTED CLAIMS

(March 13, 2024)

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I. INTRODUCTION

This investigation was instituted by the Commission on October 26, 2023 to determine whether ceiling fans—specifically, smart ceiling fans, smart fan devices, and components thereof, specifically electrical boards carrying circuitry that enables smart features thereof, receivers and their circuitry, motors, housings, electrical conversion filters, and controllers, and systems and software associated with any of the foregoing—infringe U.S. Patent Nos. 11,028,854 (“the 854 patent”), 10,488,897 (“the 897 patent”), and 11,598,345 (“the 345 patent”) (collectively, “Asserted Patents”). *See* 88 Fed. Reg. 73620 (Oct. 26, 2023). The complainant is Wangs Alliance Corporation d/b/a WAC Lighting (“WAC” or “Complainant”) and the respondents are Minka Lighting, LLC, Tech Lighting LLC, and VC Brands, LLC (altogether, “Respondents”).

Pursuant to the procedural schedule, the parties filed a joint claim construction chart setting forth certain terms to be construed, and initial and rebuttal claim construction briefs. On February 1, 2024, the scheduled *Markman* hearing was cancelled and the number of disputed terms was narrowed. Order No. 11. On February 23, 2024, the parties filed a joint claim chart. EDIS Doc. ID 814854. On March 4, 2024, the same chart was filed as an update. EDIS DOC. ID 815395.¹ At this time the only claim construction disputes involve the 854 and 345 patents.

II. RELEVANT LAW

“An infringement analysis entails two steps. The first step is determining the meaning and scope of the patent claims asserted to be infringed. The second step is comparing the properly

¹ The briefs and amended chart submitted by the parties are hereafter referred to as:

CIMB	Complainant’s Initial <i>Markman</i> Brief
CRMB	Complainant’s Rebuttal <i>Markman</i> Brief
RIMB	Respondents’ Initial <i>Markman</i> Brief
RRMB	Respondents’ Rebuttal <i>Markman</i> Brief
JC	Updated Joint Claim Construction Chart

construed claims to the device accused of infringing.” *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (en banc) (internal citations omitted), *aff’d*, 517 U.S. 370 (1996). Claim construction is a “matter of law exclusively for the court.” *Id.* at 970-71. “The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.” *Embrex, Inc. v. Serv. Eng’g Corp.*, 216 F.3d 1343, 1347 (Fed. Cir. 2000).

Claim construction focuses on the intrinsic evidence, which consists of the claims themselves, the specification, and the prosecution history. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *see also Markman*, 52 F.3d at 979. As the Federal Circuit in *Phillips* explained, courts must analyze each of these components to determine the “ordinary and customary meaning of a claim term” as understood by a person of ordinary skill in the art at the time of the invention. 415 F.3d at 1313. “Such intrinsic evidence is the most significant source of the legally operative meaning of disputed claim language.” *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Grp., Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001).

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). “Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claims terms.” *Id.* at 1314; *see also Interactive Gift Express, Inc. v. CompuServe Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (“In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to ‘particularly point [] out and distinctly claim [] the subject matter which the patentee regards as his invention.’”). The context in which a term is used

in an asserted claim can be “highly instructive.” *Phillips*, 415 F.3d at 1314. Additionally, other claims in the same patent, asserted or unasserted, may also provide guidance as to the meaning of a claim term. *Id.* “Courts do not rewrite claims; instead, we give effect to the terms chosen by the patentee.” *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1364 (Fed. Cir. 1999).

The specification “is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “[T]he specification may reveal a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess. In such cases, the inventor’s lexicography governs.” *Id.* at 1316. “In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor.” *Id.* As a general rule, however, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Id.* at 1323; *Kamstrup A/S v. Axioma Metering UAB*, 43 F.4th 1374, 1383-4 (Fed. Cir. 2022) (refusing to read several limitations from embodiments into claims); *Sunoco Partners Marketing & Terminals L.P. v. U.S. Venture, Inc.*, 32 F.4th 1161, 1176 (Fed. Cir. 2022) (holding plain language of claim was nonetheless broader than specification’s “preferably” statement). In the end, “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be . . . the correct construction.” *Id.* at 1316 (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998)).

In addition to the claims and the specification, the prosecution history should be examined, if in evidence. *Phillips* at 1317; see *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). The prosecution history can “often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the

invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Phillips*, 415 F.3d at 1317; see *Chimie v. PPG Indus. Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) (“The purpose of consulting the prosecution history in construing a claim is to exclude any interpretation that was disclaimed during prosecution.”).

When the intrinsic evidence does not establish the meaning of a claim, then extrinsic evidence (*i.e.*, all evidence external to the patent and the prosecution history, including dictionaries, inventor testimony, expert testimony, and learned treatises) may be considered. *Phillips*, 415 F.3d at 1317. Extrinsic evidence is generally viewed as less reliable than the patent itself and its prosecution history in determining how to define claim terms. *Id.* “The court may receive extrinsic evidence to educate itself about the invention and the relevant technology, but the court may not use extrinsic evidence to arrive at a claim construction that is clearly at odds with the construction mandated by the intrinsic evidence.” *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999).

If, after a review of the intrinsic and extrinsic evidence, a claim term remains ambiguous, the claim should be construed so as to maintain its validity. *Phillips*, 415 F.3d at 1327. Claims, however, cannot be judicially rewritten in order to fulfill the axiom of preserving their validity. See *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999). Thus, “if the only claim construction that is consistent with the claim’s language and the written description renders the claim invalid, then the axiom does not apply and the claim is simply invalid.” *Id.*

The construction of a claim term is generally guided by its ordinary meaning. However, courts may deviate from the ordinary meaning when: (1) “the intrinsic evidence shows that the patentee distinguished that term from prior art on the basis of a particular embodiment, expressly disclaimed subject matter, or described a particular embodiment as important to the invention”; or

(2) “the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1329 (Fed. Cir. 2009); *see also GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“the specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”); *Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1324 (Fed. Cir. 2003) (“[W]here the patentee has unequivocally disavowed a certain meaning to obtain his patent, the doctrine of prosecution disclaimer attaches and narrows the ordinary meaning of the claim congruent with the scope of the surrender.”); *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002) (“The prosecution history limits the interpretation of claim terms so as to exclude any interpretation that was disclaimed during prosecution.”). Nevertheless, there is a “heavy presumption that a claim term carries its ordinary and customary meaning.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citations omitted). The standard for deviating from the plain and ordinary meaning is “exacting” and requires “a clear and unmistakable disclaimer.” *Thorner v. Sony Computer Entm’t Am. LLC*, 669 F.3d 1362, 1366-67 (Fed. Cir. 2012); *see Epistar Corp. v. Int’l Trade Comm’n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (requiring “expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope” to deviate from the ordinary meaning) (citation omitted). As the Federal Circuit has explained, “[w]e do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that.” *Thorner*, 669 F.3d at 1366; *see Continental Circuits LLC v. Intel Corp.*, 915 F.3d 788, 797 (Fed. Cir. 2019); *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016) (“[W]e have repeatedly held that it is ‘not enough that the only embodiments, or all of the embodiments, contain a particular limitation’ to limit claims beyond their plain meaning.”).

When a patent includes claims directed to particular methods, the steps recited are not ordinarily construed to require an order unless an order is actually recited. *Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (citing *Loral Fairchild Corp. v. Sony Corp.*, 181 F.3d 1313, 1322 (Fed. Cir. 1999)); see *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1345 (Fed. Cir. 2008). Alternatively, “a claim ‘requires an ordering of steps when the claim language, as a matter of logic or grammar, requires that the steps be performed in the order written, or the specification directly or implicitly requires’ an order of steps.” *Mformation Techs., Inc. v. Research in Motion, Ltd.*, 764 F.3d 1392, 1398-99 (Fed. Cir. 2014) (citing *TALtech Ltd. v. Esquire Apparel, Inc.*, 279 Fed. Appx. 974, 978 (Fed. Cir. 2008)).

Courts are not required to construe every claim limitation of an asserted patent. See *O2 Micro Intern. Ltd. v. Beyond Innovation Technology Co.*, 521 F.3d 1351, 1362 (Fed. Cir. 2008) (citations omitted); *Vanderlande Indus. Nederland BV v. Int’l Trade Comm’n*, 366 F.3d 1311, 1323 (Fed. Cir. 2004) (noting that the administrative law judge need only construe disputed claim terms). Rather, “claim construction is a matter of resolution of disputed meanings and technical scope, to clarify and when necessary to explain what the patentee covered by the claims.” *Id.* at 1362 (quoting *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997)); see also *Embrex*, 216 F.3d at 1347 (“The construction of claims is simply a way of elaborating the normally terse claim language in order to understand and explain, but not to change, the scope of the claims.”) (citation omitted). In addition, “[a] determination that a claim term ‘needs no construction’ or has the ‘plain and ordinary meaning’ may be inadequate when a term has more than one ‘ordinary’ meaning or when reliance on a term’s ‘ordinary’ meaning does not resolve the parties’ dispute.” *O2 Micro*, 521 F.3d at 1361. Claim construction, however, is not an “obligatory exercise in redundancy.” *U.S. Surgical Corp.*, 103 F.3d at 1568. “[M]erely rephrasing or paraphrasing the plain language of a

claim by substituting synonyms does not represent genuine claim construction.” *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 863 (Fed. Cir. 2004). However, “there are limits to the court’s duties at the claim construction stage. For example, courts should not resolve questions that do not go to claim scope, but instead go to infringement . . . or improper attorney argument.” *Eon Corp. IP Holdings v. Silver Spring Networks*, 815 F.3d 1314, 1319 (Fed. Cir. 2016).

III. TECHNICAL BACKGROUND AND LEVEL OF ORDINARY SKILL

The 854 and 345 patents share a specification which teaches various schemes for remote control of ceiling fans at a customer’s premises. One scheme involves radio frequency (RF) signals from a control unit, such as those mounted on a wall, in both bi- or unidirectional communication with the fan and its lights. *See, e.g.*, 854 patent at Abstract, 7:12-24. Another involves WiFi signals, with bi-directional communication taking place between control unit and the fan, with a router in-between. *See, e.g., id.* at Abstract, 6:23-30. The patents identify certain benefits of these arrangements in situations where multiple wall switches may not be available, and as compared to manual switches or cords that are attached directly to fans. *Id.* at 1:28-47. The claims of the 854 patent generally cover fans that communicate using both RF and WiFi signals, and the nature of those signals (*e.g.*, turn light on/off, fan speed up/down). 854 patent at cls. 1-6. The claims of the 345 patent more broadly cover the use of two different “communication protocol[s],” which could be RF and WiFi, as examples, along with additional details on the power supply system. *See, e.g.*, 345 patent at cls. 1-6.

As for the ordinary skill in the art, Complainant contends it would have been a person with a “bachelor’s degree in electrical or computer engineering, or a related field, and two to three years of experience with the design or implementation of wireless communication systems, control circuits, or power electronics” where “a higher level of education or skill can make up for less experience, and vice versa.” CIMB at 9. Respondents similarly argue:

A POSA at the time of the purported inventions of the '854 and '345 patents has a Bachelor's degree in electrical or computer engineering, or a related field, and two to three years of experience with the design or implementation of wireless communication systems, control circuits, and power electronics. A higher level of education or skill can make up for less experience, and vice versa.

RIMB at 11. Complainant notes that the only difference is in Respondents use of “*and* power electronics” instead of “*or* power electronics.” CIMB at 10 n.4.

The technical complexity of the Asserted Patents is relatively low, which makes the parties' proposals appropriate. And the patents involve both power delivery and wireless communication. Thus, the person of ordinary skill is one with a bachelor's degree in electrical or computer engineering, or a related field, and two to three years of experience with the design or implementation of wireless communication systems, control circuits, and power electronics. More experience may substitute for education and vice versa; thus, graduate studies in electrical engineering or a related field may substitute for work experience and, likewise, additional work experience may substitute for relevant formal education.

IV. THE ASSERTED PATENTS

The 854 patent, entitled “Methods and Apparatus for Controlling Fan Devices,” issued on June 8, 2021 to Eric Stefankiewicz and Shelley Wald. The 854 patent reports an assignment on its face to Wangs Alliance Corporation and claims priority, *inter alia*, to a provisional application filed January 12, 2018.

The 345 patent, entitled “Methods and Apparatus for Controlling Fan Devices,” issued on March 7, 2023 to Eric Stefankiewicz, Shelley Wald, and Kevin Darrah. The 345 patent reports an assignment on its face to Wangs Alliance Corporation and claims priority, *inter alia*, to a provisional application filed January 12, 2018.

A. 854 Patent

The 854 patent has 12 claims. As of the date of this order, claims 1-3 and 8-10 are asserted in this investigation. The asserted claims read as follows (with the first instance of the disputed terms highlighted in bold):

1. A system comprising:

a fan motor;

a fan motor control circuit;

a processor in electrical communication with the fan motor control circuit;

a radio frequency interface configured to receive, at a first frequency, a signal;
and

a WiFi interface configured to communicate at a second frequency that is different from the first frequency;

wherein;

the fan motor control circuit is configured to cause the fan motor to perform an operation in response to the signal; and

the processor is configured to transmit, via the WiFi interface, to a server, an indication corresponding to the operation.

2. The system of claim 1 further comprising, when the signal is a first signal, the operation is a first operation, and the indication is a first indication:

a light; and

a light control circuit configured to cause the light to perform a second operation in response to a second signal received by the radio frequency interface;

wherein the processor is further configured to transmit to the server, via the WiFi interface, a second indication corresponding to the second operation.

3. The system of claim 2 wherein:

the first indication corresponds to an operation selected from the group consisting of: fan on, fan off, fan power state change, fan speed-up, fan speed-down, and fan direction-change; and

the second indication corresponds to an operation selected from the group consisting of: light on, light off, light power state change, light increase, and light decrease.

....

8. The system of claim 1 further comprising, when the processor is a first processor, the server;

wherein the server includes a second processor configured to cause the server to:

receive a command directed to the first processor; and

communicate the command via the Internet and a WiFi router to the first processor.

9. The system of claim 8 wherein the second processor is further configured to cause the server to update information about a state of a device that is in a wireless local network based on the command.

10. The system of claim 9 wherein the second processor is further configured to cause the server to update the information in response to transmitting the command from the server.

B. 345 Patent

The 345 patent has 23 claims. As of the date of this order, claims 1, 3-10, and 12-17 are asserted in this investigation. The asserted claims read as follows (with the first instance of the disputed terms highlighted in bold):

1. A fan device comprising:

a DC fan motor;

a fan motor control circuit;

a processor in electrical communication with the fan motor control circuit;

a first wireless interface configured to receive from a user controller a first signal corresponding to a first user command conforming to a first communications protocol; and

a second wireless interface configured to receive from a user controller a second signal corresponding to a second user command and configured to receive from a server a third signal corresponding to a third user command, the second signal and the third signal conforming to a second communications protocol that is different from the first communications protocol; wherein:

the fan motor control circuit is configured to cause the fan motor to perform a first operation in response to the first signal, a second operation in response to the second signal and a third operation in response to the third signal; and

the processor is configured to transmit, via the second wireless interface, to a server, a first indication corresponding to the first operation, a second indication corresponding to the second operation and a third indication corresponding to the third operation;

further comprising:

a mounting base configured to be mounted to a ceiling; and

an AC power interface configured to provide AC filtered power to a DC power supply configured to provide DC power to the DC fan motor;

wherein:

the processor is disposed in the mounting base;

the first wireless interface is disposed in the mounting base;

the second wireless interface is disposed in the mounting base;

the AC power interface and the DC power supply are disposed in the mounting base; and

each of the AC power interface and the DC power supply are connected to a full bridge rectifier, and the full bridge rectifier is disposed in the mounting base.

. . . .

3. The fan device of claim 1 wherein the first wireless interface is a radio frequency (RF) interface.

4. The fan device of claim 3 wherein the second wireless interface is a WiFi interface.

5. The fan device of claim 1 further comprising a fan that has a state, and the first indication includes an indication of the state.

6. The fan device of claim 5 wherein the state is a state from the group consisting of: idle, active, fan on, fan off, fan direction, and fan speed level.

7. The fan device of claim 1 configured to be paired to a user controller;

wherein:

the fan device is a first fan device;

the user controller is configured to:

be paired to a second fan device; and

transmit a signal corresponding to a group command to the first fan device and the second fan device, wherein the first fan device and the second fan device both perform the same operation in response to the group command.

8. The fan device of claim 7 wherein the user controller is a wall control unit.

9. The fan device of claim 7 wherein the user controller is a wireless terminal.

10. The fan device of claim 9 wherein the wireless terminal is a cell phone.

. . . .

12. The fan device of claim 1 further comprising:

a light; and

a light control circuit configured to cause the light to perform a lighting operation in response to a lighting signal received by the first wireless interface or the second wireless interface;

wherein the processor is further configured to transmit to a server, via the second wireless interface, a fourth indication corresponding to the lighting operation.

13. The fan device of claim 12 wherein:

the light has a state;

the fourth indication includes an indication of the state; and

the state is a state from the group consisting of: light on, light off, and light intensity level.

14. The fan device of claim 1 further comprising an antenna;

wherein:

the first wireless interface is configured to transmit and receive via the antenna; and

the second wireless interface is configured to transmit and receive via the antenna.

15. The fan device of claim 1 wherein the second indication includes a device status reporting message.

16. The fan device of claim 15 wherein the device status reporting message reports a change from a previously transmitted device status reporting message.

17. The fan device of claim 16 wherein the change is in response to a control message transmitted by a wireless terminal.

V. CLAIM CONSTRUCTION

The disputed claim terms are summarized in the parties' Joint Claim Construction Chart.

See JC. They are discussed individually below. The parties provided no agreed constructions.

A. 854 Patent – “a radio frequency interface configured to receive” and “a WiFi interface configured to communicate”

Term	Complainant's construction	Respondents' construction
“a radio frequency interface configured to receive”	Plain and ordinary meaning, which is: a radio frequency interface that is configured to receive	Plain and ordinary meaning, which is: a radio frequency interface adapted to receive using a RF receiver
“a WiFi interface configured to communicate”	Plain and ordinary meaning, which is: a WiFi interface that is configured to communicate	Plain and ordinary meaning, which is: a WiFi interface adapted to communicate using a WiFi transmitter and WiFi receiver, separate from the RF receiver

JC at 3.

As reflected in the table above, Respondents identify two disputes over the “interface” terms, but it aids the analysis to consider them as three: 1) whether a “radio frequency interface configured to receive” must be adapted to use a RF receiver; 2) whether a “a WiFi interface configured to communicate” must be adapted to use a WiFi receiver and a WiFi transmitter; and 3) whether the two receivers (RF and WiFi) must be separate structures or “separate components.” *See* RIMB at 12-14; RRMB at 3 (“Respondents’ proposed constructions reflect the meaning of the proposed terms as they would be understood by a POSA in view of the intrinsic record, which repeatedly and consistently refers to the interfaces separately, each with separate receivers.”).

Respondents find support for the proposed separation directly in the claims because the “interfaces . . . are, on their face, claimed as different elements, each with their own antecedent basis” and because of additional elements reciting first and different-from-first frequencies

(discussed further below) assigned to each interface. *See* RIMB at 13-14 (citing, *inter alia*, *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)). They also point to the word “configured” as requiring more than simple capability—meaning a “general purpose wireless interface” would be insufficient for either of “radio frequency interface” and the “WiFi interface.” *Id.* at 14; RRMB at 6 (“[A] POSA would understand that implementation of any receiver in each wireless interface would necessarily comprise at least some hardware components specifically adapted for a given application”) (citing RRMB, Ehsani Decl. at ¶¶ 34-36, 51-63). And they point to the interfaces’ use of “first” and “second” frequencies, respectively, as suggesting, if not requiring, separate receivers. RIMB at 14.

As for the specification, Respondents assert, “[t]he specification repeatedly describes the RF/first interface and the WiFi/second interface, and their respective receivers and transmitters, as separate components.” RIMB at 15 (citing, *inter alia*, 854 patent at 1:17-17, 2:5-6, 4:40-43, 8:31-38, 8:57-61, 9:10-13, 10:65-11:2); RRMB at 5. Here, Respondents particularly point to Figure 3, stating, “[c]onsistent with every embodiment shown or discussed in the specification, Figure 3 [] makes it graphically clear that the interfaces (312, 314) and their respective receivers (356, 360) and transmitters (354, 358) are separate structures.” RIMB at 15. Regardless, Respondents urge, the specification can be set aside as the language of the claims is dispositive. *See* RRMB at 5 (“Even assuming, hypothetically, that the specification somehow contemplates embodiments having a single shared interface or receiver, such embodiments would be outside the scope of the claims, which require two separate interfaces, each with a separate receiver. The claim language itself leads to this result.”).

Finally, Respondents look to two moments from the prosecution histories of the 854 and 345 patents. In the 854 patent history, they highlight the applicant’s remark that the examiner had not

“separately, clearly and precisely” identified each of “radio frequency signal receiver” and “WiFi interface,” among other terms, in the applied prior art reference. RIMB at 16-17 (citing RIMB, Ex. 4 at -000153-154, 337). In the 345 patent history, Respondents note an argument from the applicant that the prior art’s communication through “any suitable type of network or combination of networks” did not meet “a first wireless interface and a second wireless interface.” *Id.* at 18 (citing RIMB, Ex. 8 at [0083]-[0085]; RIMB, Ex. 6 at -0002129, -2235, -2240). To Respondents, this is “an admission that the claim requires two distinct interfaces, instead of a single one capable of accessing a combination of networks.” *Id.*

Complainant, on the other hand, contends “[t]he plain language of the claims does not require that any of the claimed interfaces have its own discrete receiver.” CIMB at 13; CRMB at 3 n.6 (“The dispute is whether the two claimed interfaces must necessarily each have its own separate ‘receiver.’”). It asserts:

While some specific electronic components are called out in the independent claims (*e.g.*, “full bridge rectifier,” ’345 Patent, 41:50), Complainant chose not to claim any specific components (*e.g.*, “receiver,” “transmitter,” “antenna”) of either of the wireless interfaces, keeping the scope of the “interface” terms not limited to specific distributions of hardware.

CIMB at 14. Even if accepted as required elements, Complainant further argues the receivers need not be “wholly separate” because “the Federal Circuit has repeatedly rejected attempts to require physically separate components merely because they are recited in separate claim terms.” *Id.* (citation omitted); CRMB at 5-6 (citing *Linear Tech. Corp. v. Int’l Trade Comm’n*, 566 F.3d 1049, 1055 (Fed. Cir. 2009)). Further, Complainant cites its expert to explain overlapping hardware between interfaces was commonplace:

[P]ersons of ordinary skill in the art at the time of filing of the Asserted Patents understood that multiple wireless interfaces and protocols could share overlapping hardware and/or software for reception or even utilize a single integrated piece of hardware. Ex. 6 ¶¶ 76-87. A wireless interface may use a discrete receiver or,

alternatively, a wireless interface (*e.g.*, Bluetooth) can share part or all of a receiver with another interface (*e.g.*, WiFi). *Id.* For example, a single integrated circuit chip, that includes one integrated antenna, may enable communications on multiple frequencies. *Id.* ¶¶ 83, 90-91. Such single-chip wireless modules were well known to a POSA as of the priority date of the patents and clearly within the scope of the claims. *Id.* ¶¶ 76-87.

CIMB at 15; *see* CRMB at 4. Complainant additionally views Respondents as conceding that no lexicography or disclaimer has taken place because they (Respondents) describe their constructions as the plain and ordinary meaning (CIMB at 15); and that a prosecution history amendment from “radio frequency signal receiver” to “radio frequency interface” indicated a broadening intent (*id.* at 18-19 (citing CIMB, Ex. 3 at -000083-84, -341); CRMB at 4-5).

Complainant further accuses Respondents of “merely point[ing] to various examples in the specification and improperly insist that those examples should be limiting.” CRMB at 8 (citing *Unwired Planet, LLC v. Apple Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016)), 9 (citing *Thorner*, 669 F.3d at 1366). Nevertheless, it contends “a POSA would understand the specification to disclose that the interfaces could share hardware” based on a disclosure in the 854 patent specification that the same antenna could be used for both RF and WiFi interfaces. CRMB at 9-10 (citing 854 patent at 9:7-9). Complainant reasons, “[a] POSA would understand that components sharing an antenna could also use a single receiver.” *Id.* (citing CIMB, Ex. 6 (Kakaes Decl.) at ¶¶ 90-91).

Respondents are partially persuasive, but no aspects of their constructions are adopted. To begin, “a radio frequency interface configured to receive” surely has, somewhere within it, a “receiver.” “Interface” is a broad term and can be comprised of any number hardware/software implementations. CIMB, Ex. 6 (Kakaes Decl.) at ¶ 75. “Receiver,” too, is ordinary and broad, and simply means a component which receives a signal. *Id.* at ¶ 48. Thus, it is difficult to see how an interface “configured to receive” could have no receiver of any kind. To the extent Complainant

argues otherwise (*see* CIMB at 13; CRMB at 3; *but see* CIMB, Ex. 6 (Kakaes Decl.) at ¶¶ 75-76 (opining that “interface” by itself does not necessarily invoke a receiver)), it is incorrect.

For this same reason, however, there is no reason to append “using a receiver” to the construction of “a radio frequency interface configured to receive.” It is redundant, and claim construction is not an exercise in redundancy, and it seemingly rules out the use of other hardware/software implementations, including using a transceiver. *U.S. Surgical Corp.*, 103 F.3d at 1568. The same is true for specifying that it is an “RF” or “WiFi” receiver—these aspects are already recited in “a radio frequency interface configured to receive” and “a WiFi interface configured to communicate,” respectively.

This leaves the question of whether there must be physically separate “receivers” for each interface—*i.e.*, the two interfaces may not share a “receiver.” There is insufficient evidence to support reading-in this restriction. The Patent Act declares that a patent’s specification shall contain a written description of the invention and will shall conclude with claims that the patentee has chosen to “particularly point[] out and distinctly claim[] the subject matter which the applicant regards as his invention.” 35 U.S.C. § 112. This is why the Federal Circuit has held: “We do not read limitations from the specification into claims; we do not redefine words. Only the patentee can do that. . . . It is the claims that define the metes and bounds of the patentee's invention. The patentee is free to choose a broad term and expect to obtain the full scope of its plain and ordinary meaning unless the patentee explicitly redefines the term or disavows its full scope.” *Thorner*, 669 F.3d at 1366-67 (citing *Phillips*, 415 F.3d at 1313). And the evidence showing any redefinition or disavowal must be clear and unmistakable. *Id.*

Respondents’ evidence is far from clear and unmistakable. The 854 patent provides no instruction on the physical structures of its interfaces, receivers, transmitters, or the like, leaving

such details entirely up to the background knowledge of those of ordinary skill in the art. *See generally* 854 patent at Figs. 1-11, 5:29-42:59. For example, Figure 3 is the only figure Respondents refer to and they assert it “makes it graphically clear” that the interfaces are separate structures. RIMB at 15. But Figure 3 is a box diagram providing an overview of connection paths:

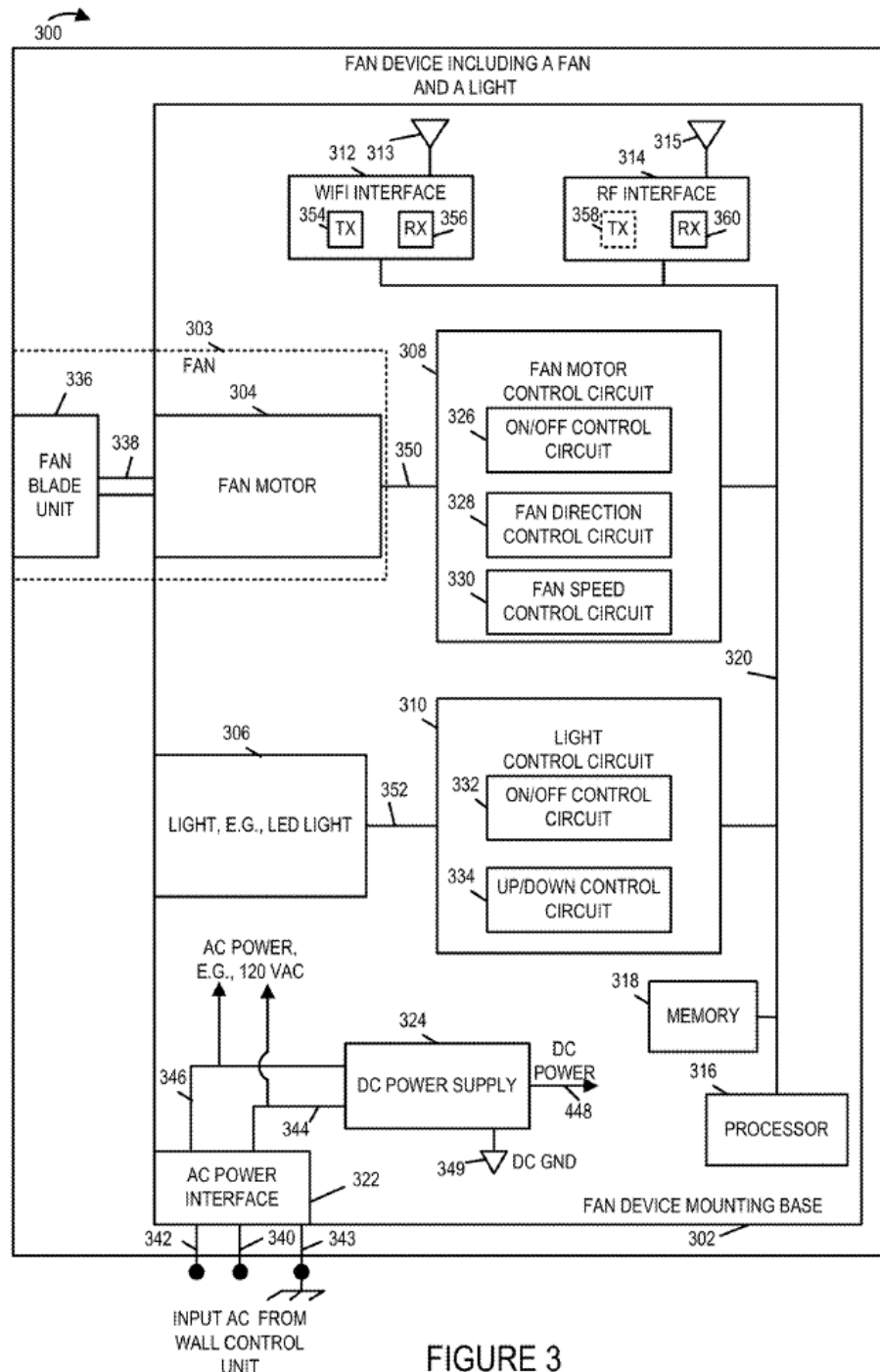


FIGURE 3

854 patent at Fig. 3. There is no more reason in Figure 3 to require RF and WiFi interfaces to be separate structures than there is to require all antennas be triangular-shaped, or for memory to be connected to a processor via a wire with a single 90 degree bend. Indeed, the patent discusses the figure in a way contrary to what is shown. The figure shows two antennas, but the patent states: “[i]n some embodiments the same antenna is used for both the WiFi interface 312 and the RF interface 314.” 854 patent at 9:7-9. It also states, “[i]n some embodiments, the fan device includes a single circuit board that includes the WiFi interface 312, RF interface 314, fan motor control circuit 308, light control circuit 310, AC power interface 322, DC power supply 324, memory 318 and processor 316” (*id.* at 10:65-11:2), but the figure’s rectangle borders could suggest multiple boards. So it is far from “graphically clear” that the two interfaces are structurally separate.

None of Respondents’ other excerpts do anything more than list “RF interface” alongside “WiFi interface.” *See* RIMB at 13-16. This shows the two are distinct concepts or distinct functional elements, but offers no insight as to their structure, shared or otherwise. And this is in no way inconsistent with the Federal Circuit’s instruction that, “[w]here a claim lists elements separately, ‘the clear implication of the claim language’ is that those elements are ‘distinct components’ of the patented invention.” *Becton*, 616 F.3d at 1254; RIMB at 13; *but see Google LLC v. EcoFactor, Inc.*, No. 22-1750, 14 (Fed. Cir. 2024) (“there is a ‘presumption’ that separately listed claim limitations may indicate separate and distinct physical structure, but that presumption may always be rebutted in the context of a particular patent.”). Again, what is clear from this intrinsic evidence is that the patentee elected to leave the structure and construction of the interfaces up to the background knowledge of those of ordinary skill in the art.

Respondents’ prosecution history excerpts fare no better. The 854 patent Office Action response involved the applicant asking for “clarification” as to where “radio frequency receiver”

and “WiFi interface” were allegedly located within the prior art reference. RIMB, Ex. 4 at -000152-154. The applicant did this because the applied prior art only spoke broadly of “load control devices” communicating over radio-frequency signals, with commands “originating” from a WiFi-enabled smart device. *Id.* at -000152. The degree of separateness between interfaces was not at issue. And the correspondence in the 345 patent’s history involved the applicant challenging whether “first” and “second” interfaces were present in a prior art’s fan device as opposed to the wall control unit of that fan device. See RIMB, Ex. 6 at -0002129, -2234-2241. The applicant was able to do this because the claims had just been amended from an “apparatus” to the more specific “fan device”; and the prior art reference only taught WiFi communication between a *wall control unit* and a user’s personal device. *Id.* at -0002234-2241; *see id.* at -0002129 (citing RIMB, Ex. 8 at [0083]-[0086]); RIMB, Ex. 8 at [0083]-[0086]. In either event, there was no disavowal or lexicography to support Respondents’ proposed constructions.

Lastly, turning to extrinsic evidence, Complainant’s expert is persuasive, opining that overlapping receiver hardware was known and common (CIMB, Ex. 6 (Kakaes Decl.) at ¶¶ 76-87); and Respondents’ expert apparently agrees:

37. Integrated wireless interfaces can be designed to utilize multiple protocols that operate at the same or similar frequency bands. One example are interfaces that can be used to communicate using WiFi and Bluetooth signals. As signals conforming to both protocols can be in the same 2.4 GHz frequency band and can be demodulated using similar techniques, a single shared receiver may be used to receive both types of signals. In such systems, the receiver will switch between receiving Bluetooth and WiFi signals, as determined using a timedomain multiplexing strategy.

(RRMB, Ehsani Decl. at ¶ 37; *see id.* at ¶ 64 (“Devices that include a single interface for communicating using more than one protocol were available to a POSA prior to the earliest priority date of the ’854 and ’345 patents.”)). And even accepting Respondents’ expert’s point that “the design and engineering of an interface is typically tailored to optimize receipt and transmission of

wireless signals based on specific properties of the signal” and “a receiver configured to conform to a specific protocol would require internal structures to allow the receiver to communicate at that protocol” (*id.* at ¶ 61), this does not require two interfaces having completely separate structures.

Accordingly, “a radio frequency interface configured to receive” and “a WiFi interface configured to communicate” are construed as Complainant proposes—“a radio frequency interface that is configured to receive” and “a WiFi interface that is configured to communicate.”

B. 854 Patent – “first frequency” and “second frequency that is different from the first frequency”

Term	Complainant’s construction	Respondents’ construction
“first frequency”	Plain and ordinary meaning, which is: first frequency	Plain and ordinary meaning, which is: RF frequency in a different frequency band than the frequency band used for WiFi signals
“second frequency that is different from the first frequency”	Plain and ordinary meaning, which is: second frequency different from the first frequency	Plain and ordinary meaning, which is: WiFi frequency in a different frequency band than the frequency band used for RF signals

JC at 3.

For the “frequency” limitations, Respondents contend “that the claimed ‘first frequency’ is an RF frequency in a different frequency band than the frequency band used for WiFi signals”—and that the second “is a ‘WiFi frequency in a different frequency band than the frequency band used for RF signals.’” RIMB at 27-28; *see* RRMB at 9. They argue this is brought about by the larger claim limitations in which the terms appear; namely, “a radio frequency interface configured to receive, at a first frequency, a signal” and “a WiFi interface configured to communicate at a second frequency that is different from the first frequency,” and specification passages that disclose different “bands” of frequencies. *See* RIMB at 28-29 (citing 854 patent at 2:21-22, 4:15-19, 9:3-7,

11:29-38, 26:66-27:4, 28:61-65); RRMB at 10, 12 (citing 854 patent at 7:25-31), 14 (citing 854 patent at 2:1-25). They also bring attention to the applicant's characterization of a particular claim amendment during prosecution of the patent. RIMB at 29-31 (citing RIMB, Ex. 4 at -0000334-5, -339); RRMB at 15).

From a technological standpoint, Respondents refer to the opinions of their expert to show a POSITA reading the 854 patent would understand that “an ‘RF interface’ that ‘uses a different frequency band than the frequency band used for WiFi signals sent to/from the WiFi router,’” means “a legacy RF interface operating in the sub-GHz frequency band that does not overlap with the WiFi frequency band.” RRMB at 12 (citing RRMB, Ehsani Decl. at ¶ 46, 65). Respondents warn that Complainant's simple construction is contrary to the purpose of the invention and should not be followed:

Under Complainant's broad read, in which the “first frequency” could be any frequency, even within the WiFi frequency band, a system implementing two identical WiFi interfaces would fall within the scope of the claim. Such a broad read would undermine the patent's description of the “present invention” as requiring two “different interfaces,” and the repeated and consistent requirement for the RF and the WiFi interfaces to use “different frequency bands.” *See* Ehsani Decl. ¶¶ 57, 71, 77-78.

Id. Indeed, Respondents assert the specification “does not disclose any examples where [the two interfaces] operate in the same frequency band.” *Id.* at 14.

Complainant rejects defining a “frequency” as within any particular “band” and views Respondents as “changing the terms to mean something qualitatively different.” CIMB at 20. It explains the difference as follows:

A “frequency band” is a “particular range of frequencies that forms part of a larger continuous series of frequencies.” Ex. 16 at 658. A frequency band can have many frequencies within it that are different frequencies yet in the same frequency band. Ex. 6, ¶¶ 99-107. Indeed, a frequency band usually has numerous channels (subranges of frequencies) that are still within the same band. *Id.*; *see also Certain Electronic Anti Theft Shopping Cart Wheels, Components Thereof And Systems*

Containing The Same, 337-TA-1357, Order No. 11 at 18 (August 14, 2023) (construing a “2.4 GHz frequency band” as “frequencies in the range of 2.4 GHz to 2.5 GHz” 11) (emphasis added).

CIMB at 21. Complainant also highlights claim 2 of the related, 345 patent, which uses both terms thereby indicating different meanings. *Id.* at 21-22 (citing 345 patent at cl. 2; *Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008)); *see* CRMB at 13 (citing *SightSound Techs., LLC v. Apple Inc.*, 809 F.3d 1307, 1316, 1318 (Fed. Cir. 2015)). Complainant further contends there is no lexicography or disclaimer to support Respondents’ interpretation (*see* CIMB at 22-24 (“The consistent qualification for only ‘some [or various] embodiments,’ and the use of different ‘frequency’ and ‘frequency band’ terms emphasizes that the claims encompass both types of systems.”); *see* CRMB at 19-20) and that interpretation is otherwise technically incorrect (CIMB at 24-25 (“WiFi is a family of wireless network protocols or standards. . . . WiFi operates *on RF frequencies*, just like Bluetooth. . . . [The patent] does not use term ‘WiFi frequency.’ Rather, it refers to ‘WiFi signals.’”)).

Respondents’ narrowing constructions are not persuasive. First, the plain and ordinary meaning of a “frequency” does not speak to the band in which the frequency exists. The experts agree. Respondents’ states, “[w]ireless signals occupy a particular range of frequencies, which indicate the number of cycles per second of the electromagnetic waves carrying the information.” RRMB, Ehsani Decl. at ¶ 26; *see* RIMB at 28 n.7. Complainant’s states, “[c]onveying [] information by radio waves requires the presence of a ‘carrier.’ The carrier is a radio wave having a certain frequency. The frequency is simply the number of oscillations of the wave per second.” CIMB, Ex. 6 (Kakaes Decl.) at ¶ 48. So Respondents’ characterization of their constructions as the plain and ordinary meanings is not accurate.

And to the extent that a “radio frequency interface” likely or even certainly communicates in the RF frequency band as understood by a POSITA (RIMB at 28), this is a feature of the specific term, “radio frequency interface” (discussed above) and not the more general, “first frequency.” The same is true for “WiFi interface.” A “WiFi interface” communicates in WiFi frequency bands—that is what makes the interface “WiFi.” But this has nothing to do with the meaning of “frequency,” which is a count of cycles per unit of time. This distinction is bolstered by the specification. In essentially all of Respondents’ chosen excerpts, frequency “bands” are brought up when discussing interfaces, not when discussing frequencies on their own. *See id.* at 29.

Second, the phrase, “that is different from the first frequency” does not necessarily mean “in a different frequency band than the [first frequency].” As noted above, the plain and ordinary meaning of “frequency” is simply a count of cycles per unit of time. Logically then, a frequency “that is different” from another frequency means it is different in terms of the count of cycles per unit of time, and a single band contains many of these (by definition).

To escape this plain meaning, there must be clear and unmistakable lexicography or disavowal by the patentee. *GE Lighting Sols.*, 750 F.3d at 1309; *Thorner*, 669 F.3d at 1366-67; *Kyocera Senco Industrial Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1378 (Fed. Cir. 2022). There is no such evidence in the intrinsic record. While Respondents’ examples from the claims and specification (RIMB at 28-29; RIMB at 10-11) consistently teach different interfaces using different bands, or spectrums, of frequencies (*see, e.g.*, 854 patent at 2:21-25), they do not interchange “frequency” for “frequency band” (*i.e.*, no lexicography) nor somehow remove one from the other’s coverage (*i.e.*, no disavowal of scope). Rather, it is more likely that a POSITA reading the specification would recognize and appreciate that where the specification speaks in terms of different frequency bands, the claims only require different frequencies. *SimpleAir, Inc. v.*

Sony Ericsson Mobile Commc'ns AB, 820 F.3d 419, 431 (Fed. Cir. 2016).² And it is the claims which define the invention, not the specification. 35 U.S.C. § 112.

To the extent the specification fails to teach any examples or embodiments where the two interfaces operate within the same frequency band (RRMB at 14), that is a written description problem and not a reason to depart from the plain and ordinary meaning. Respondents themselves state, “Complainant’s proposed construction removes any practical limitation on the frequencies at which the interfaces operate to *improperly broaden the claim scope* and would include a system having two WiFi interfaces.” RRMB at 9-10 (emphasis added). A plain and ordinary meaning which is overbroad as compared to the specification is a section 112 invalidity issue. “As this court has repeatedly stated, the purpose of the written description requirement is to ‘ensure that the scope of the right to exclude, as set forth in the claims, does not overreach the scope of the inventor’s contribution to the field of art as described in the patent specification.’” *Ariad Pharms., Inc. v. Eli Lilly and Co.*, 598 F.3d 1336, 1353-54 (Fed. Cir. 2010); *see Juno Therapeutics, Inc. v. Kite Pharma, Inc.*, 10 F.4th 1330, 1336 (Fed. Cir. 2021) (considering whether written description was satisfied for the “full scope of the claimed invention”); *MagSil Corp. v. Hitachi Global Storage Techs., Inc.*, 687 F.3d 1377, 1383 (Fed. Cir. 2012) (“The open claim language chosen by the inventors does not grant them any forgiveness on the scope of required enablement.”).

The prosecution history provides no clear and unmistakable disclaimer, either. Respondents’ cited excerpt involves the applicant’s statement that its amended claim 10 (which was renumbered claim 1 upon issuance) “includes subject matter from the previous version of claim 13.”

² Respondents acknowledge *SimpleAir* but argue it is inapplicable because their construction does not equate “frequency band” and “frequency.” RRMB at 17. But that is effectively what Respondents do—taking claim language that recites a difference between frequencies, and interpreting it as a difference between frequency bands.

RIMB, Ex. 4 at -000339. And that version of claim 13 had recited, “wherein said first RF control signal and said second RF control signal are sent using RF frequencies which are not used for WiFi signals.” Id. at -000148. In that same amendment, the applicant distinguished the prior art based on the now-disputed limitations “a radio frequency interface configured to receive, at a first frequency, a signal” and “a WiFi interface configured to communicate at a second frequency that is different from the first frequency”:

II. Claim Amendments

A clean copy of the amended claims is provided in the Attachment.

Claims 1-9

Applicant has cancelled claims 1-9.

Independent Claim 10

Applicant has amended independent claim 10 to include:

***a radio frequency interface configured to receive, at a first frequency, a signal; and
a WiFi interface configured to communicate at a second frequency that is different
from the first frequency.***

Suro does not disclose:

***a radio frequency interface configured to receive, at a first frequency, a signal; and
a WiFi interface configured to communicate at a second frequency that is different
from the first frequency.***

Applicant notes that claim 10 includes subject matter from the previous version of claim 13, to which the Examiner applied Suro para. 6. Office Action, pg. 6. Suro, however, whether in

para. 6 or elsewhere, does not disclose the claimed ***second frequency that is different from the claimed first frequency.***

For at least this reason, Applicant submits that independent claim 10, and the claims that depend therefrom, are patentable over Suro.

RIMB, Ex. 4 at -000339-40.

“Subject matter” is a broad concept, however, and it could be said that current claim 1 contains the “subject matter” of previous claim 13 simply by reciting frequencies that are different from one another (frequencies existing in different bands are automatically different from one another). Another possible interpretation is Respondents.’ But both are plausible and competing plausible interpretations do not make for “unmistakable” disclaimer. *CUPP Computing AS v. Trend Micro Inc.*, 53 F.4th 1376, 1382 (Fed. Cir. 2022) (citing *Avid Tech., Inv. v. Harmonic, Inc.*, 812 F.3d 1040, 1045 (Fed. Cir. 2016)). It is also notable that, in earlier correspondence, the patentee argued the same prior art failed to teach “an RF frequency which is not used for WiFi signals” as recited in previous claims 3 and 13 (*see* RIMB, Ex. 4 at -000157-8)—and then changed that language to its present form before arguing the same point (*id.* at -000339-40 (“Suro . . . does not disclose the claimed *second frequency that is different from* the claimed *first frequency*.”)). Again, it is plausible that the patentee either thought the new language meant the same as the old (different frequencies means different frequency bands) or meant what it literally said (different frequencies are different frequencies). Both are of the same “subject matter,” so neither establishes clear and unmistakable disclaimer.

Accordingly, “first frequency” means “first frequency,” “second frequency that is different from the first frequency” means “second frequency different from said first frequency,” and these terms simply refer to two frequencies (cycle per unit of time) which are not the same.

C. 345 Patent – “a first wireless interface configured to receive” and “a second wireless interface configured to receive”

Term	Complainant’s construction	Respondents’ construction
“a first wireless interface. configured to receive”	Plain and ordinary meaning, which is: a first wireless interface that is configured to receive	Plain and ordinary meaning, which is: a first wireless interface adapted to receive using a first receiver

“a second wireless interface configured to receive”	Plain and ordinary meaning, which is: a second wireless interface that is configured to receive	Plain and ordinary meaning, which is: a second wireless interface adapted to receive using a second receiver, separate from the first receiver
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JC at 4.

According to the joint chart, the parties’ constructions for “a first wireless interface configured to receive” and “a second wireless interface configured to receive” in the 345 patent mirror the “interface” terms in the 854 patent. Consistent with that, Respondents’ combine the argument and evidence for both patents, as does Complainant in large part. *See* RRMB at 2-9; CRMB at 18. And for those same reasons, Respondents’ proposals to recite “using a . . . receiver” and to require the interfaces be structurally separate are rejected.

Accordingly, “a first wireless interface configured to receive” and “a second wireless interface configured to receive” will be construed as Complainant proposes—“a first wireless interface that is configured to receive” and “a second wireless interface that is configured to receive.”

SO ORDERED.



Cameron Elliot
Administrative Law Judge