

**IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF TEXAS
DALLAS DIVISION**

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|-----------------------------|---|---------------------------------|
| COMMSCOPE TECHNOLOGIES LLC, | § | |
| | § | |
| Plaintiff, | § | |
| Counterclaim Defendant, | § | |
| | § | |
| v. | § | |
| | § | |
| DALI WIRELESS, INC., | § | Civil Action No. 3:16-cv-0477-M |
| | § | |
| Defendant, | § | |
| Counterclaim Plaintiff, | § | |
| | § | |
| v. | § | |
| | § | |
| COMMSCOPE CONNECTIVITY LLC, | § | |
| | § | |
| Counterclaim Defendant. | § | |

ORDER

Before the Court are CommScope’s Motion for Partial Summary Judgment (ECF No. 205) and Dali’s Motion for Partial Summary Judgment (ECF No. 208). For the following reasons, CommScope’s Motion is **GRANTED IN PART** and **DENIED IN PART**, and Dali’s Motion is **DENIED**.

I. Factual and Procedural Background

Plaintiff, CommScope Technologies LLC, alleges infringement of U.S. Patent Nos. 9,332,402; 8,577,286; 8,326,218; 7,639,982 (collectively the “402 Patent Family”) and U.S. Patent No. 7,848,747 (the “747 Patent”) by Defendant, Dali Wireless, Inc. (“Dali”). Dali asserts counterclaims against CommScope Technologies LLC and CommScope Connectivity LLC (collectively and singly “CommScope”), alleging infringement of U.S. Patent Nos. 9,031,521 (the “521 Patent”) and 9,531,473 (the “473 Patent”) by CommScope.

CommScope accuses Dali's tSeries and Matrix products of infringing twenty claims of the '402 Patent Family and Claims 7, 8, and 10 of the '747 Patent. Dali accuses CommScope's FlexWave Prism product of infringing Claims 1–3, 16, and 20 of the '521 Patent and CommScope's ION-E product of infringing Claims 6–21 of the '473 Patent.

CommScope moves for summary judgment of invalidity and non-infringement of Dali's '473 Patent, invalidity and non-infringement of Dali's '521 Patent, and infringement by Dali of the '747 Patent. (ECF No. 206-1). Dali moves for summary judgment of non-infringement of CommScope's '747 Patent and invalidity and non-infringement of CommScope's '402 Patent Family. (ECF Nos. 209-1, 209-2, and 209-3).

The Court grants summary judgment that Dali infringes Claims 7, 8, and 10 of CommScope's '747 Patent, and that CommScope does not infringe Claims 3, 16, and 20 of Dali's '521 Patent. Summary judgment is denied on all other grounds.

II. Legal Standard and Issues

Summary judgment is proper when there is no genuine issue of material fact, and the movant is entitled to judgment as a matter of law. Fed. R. Civ. P. 56(a). Once the movant meets its initial burden to show that there is no genuine issue of material fact, the burden shifts to the nonmoving party to produce competent evidence showing the existence of a genuine issue for trial. *Celotex Corp. v. Catrett*, 477 U.S. 317, 330 (1986). The court must view all evidence in the light most favorable to the party opposing the motion. *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1331 (Fed. Cir. 2006). The substantive law determines which facts are material. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986).

a. Invalidity

i. 35 U.S.C. § 101

Section 101 of the Patent Act, defining patentable subject matter, states: “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101.

The Supreme Court has established a two-step framework to determine patent eligibility under Section 101. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 84 (2012). First, a court must first determine whether the character of the relevant claims is directed to a patent-ineligible concept. *Alice Corp. Pty. Ltd. v. CLS Bank Intern.*, 573 U.S. 208 (2014). If the character of the claims is directed to a patent-ineligible concept, the court must then consider the elements of each claim both individually and “as an ordered combination” to determine whether the elements “transform the nature of the claim” into a patent-eligible matter. *Alice*, 573 U.S. at 217 (citing *Mayo*, 566 U.S. at 72-73). To save a patent at the second step, an inventive concept must be evident in the claims. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016).

ii. 35 U.S.C. § 102

Establishing invalidity by anticipation under Section 102 is an especially heavy burden for a patent challenger. *Koito Mfg. Co. v. Turn–Key–Tech, LLC*, 381 F.3d 1142, 1151 (Fed. Cir. 2004). To show that a patent claim is anticipated under 35 U.S.C. § 102, the movant must show, by clear and convincing evidence, that each limitation of the claim is described or embodied, either expressly or inherently, in a single prior reference. *Gechter v. Davidson*, 116 F.3d 1454, 1457 (Fed. Cir. 1997).

When summary judgment of anticipation is sought, an alleged infringer must put forward specific evidence sufficient to establish the anticipation defense as a matter of law. *Schumer v.*

Lab. Computer Sys., 308 F.3d 1304, 1315-16 (Fed. Cir. 2002). Typically, evidence showing anticipation is testimony from an expert, who identifies each claim element, states the witness's interpretation of each claim element from the perspective of one skilled in the art, and also explains in detail how each claim element is disclosed in the prior art reference. *Id.*

iii. 35 U.S.C. § 112

To be valid under 35 U.S.C § 112, a claim must satisfy two separate and independent requirements: the patent must sufficiently describe the claimed invention, and must enable the invention's production and use. *Alcon Research Ltd. v. Barr Labs., Inc.*, 745 F.3d 1180, 1188 (Fed. Cir. 2014). The written description inquiry focuses on whether the patentee provides a description that identifies the claimed invention in sufficient detail so that a person of ordinary skill in the art at the time of filing would understand what the inventor had claimed. *Allergan, Inc. v. Sandoz Inc.*, 796 F.3d 1293, 1308 (Fed. Cir. 2015). Enablement is an objective inquiry into the four corners of the specification, from the perspective of a person of ordinary skill in the art. *Allergan*, 796 F.3d at 1308. To establish that a claim is not enabled under § 112, the party claiming invalidity must show, by clear and convincing evidence, that the patent specification does not enable a person of ordinary skill in the art to make and use the claimed invention. *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 684 (Fed. Cir. 2015).

Enablement is a legal question based on underlying factual determinations. *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1355 (Fed. Cir. 2012). A claim is enabled even if a "considerable" amount of experimentation is necessary to create the invention, so long as the experimentation is "merely routine," or if the specification provides a reasonable amount of guidance as to the direction in which experimentation should

proceed. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). However, if “undue experimentation” is required, the claim is invalid under § 112 as not enabled. *Id.*

b. Infringement

An accused infringer moving for summary judgment of non-infringement must show that when all reasonable factual inferences are drawn in favor of the patentee, no reasonable jury could find that the asserted claims were infringed. *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1353 (Fed. Cir. 2001). This determination requires a two-step analysis: the claims must be properly construed to determine the scope and meaning of the claims; and then the allegedly infringing device or process must be compared to the construed claims. *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004).

Literal infringement requires that the accused device or process contain each limitation of the asserted claim. *Bayer AG v. Elan Pharm. Research Corp.*, 212 F.3d 1241, 1247 (Fed. Cir. 2000). Under the doctrine of equivalents, a device or process infringes if each limitation that is not literally satisfied is satisfied by an equivalent. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1459 (Fed. Cir. 1998) (*en banc*). An element of an accused device or process is equivalent to a claim limitation if the accused device or process performs substantially the same function in substantially the same way to obtain the same result as the claim limitation. *Eagle Comtronics, Inc. v. Arrow Commc’n Labs., Inc.*, 305 F.3d 1303, 1315 (Fed. Cir. 2002).

c. Claim Construction

The purpose of claim construction is to determine the meaning and scope of the asserted claims. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995) (*en banc*). When the parties raise an actual dispute regarding the proper scope of a claim, the court, not the jury, must resolve that dispute. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d

1351, 1362 (Fed. Cir. 2008). Claim construction is a matter of resolution of disputed meanings and technical scope, to clarify what the claims cover. *U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997).

d. Prosecution Disclaimer

Prosecution disclaimer is a fundamental precept of claim construction that promotes the public notice function of the intrinsic evidence and protects the public's reliance on definitive statements made during prosecution. *Omega Eng'g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1323-24 (Fed. Cir. 2003). Prosecution disclaimer prevents patentees from recapturing, through claim interpretation, constructions and interpretations disclaimed during prosecution. *Id.* at 1325–26.

When a patentee unequivocally and unambiguously disavows a certain meaning to obtain a patent, either through amendment or argument to the examiner, prosecution history disclaimer narrows the meaning of the claim, consistent with the scope of what was surrendered. *Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1095 (Fed. Cir. 2013). Prosecution disclaimer may result from statements by a patentee during the prosecution or during an *inter partes* review proceeding. *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1361–62 (Fed. Cir. 2016).

III. Analysis

All patents-in-suit relate to distributed antenna systems. Distributed antenna systems allow for increased signal coverage. One use of distributed antenna systems is to allow cellphones located in a large building to send and receive cell tower signals through a system of antennas distributed throughout the building, thereby improving reception and connectivity.

Distributed antenna systems typically consist of three components: a base station, a host unit, and at least one remote unit. The base station receives signals from service providers and

communicates the signals to the host unit. The host unit processes the signals, such as by amplifying them or converting them to a format better suited for transmission. The host unit then sends the processed signals to remote units distributed throughout the building, and cellphones receive the processed signals from the remote units.

a. CommScope's '747 Patent

CommScope's '747 Patent is titled "System and Method for Enhancing the Performance of Wideband Digital RF Transport Systems," and discloses a distributed antenna system and method with a host unit that improves the rate and efficiency of signal transmission to remote units.

i. Infringement of CommScope's '747 Patent

CommScope moves for summary judgment, arguing that Dali's accused products infringe Claims 7, 8, and 10 of CommScope's '747 Patent, either literally or under the doctrine of equivalents. (ECF No. 206-1 at 20). Dali moves for summary judgment, arguing that its accused products do not infringe the asserted claims of the '747 Patent, either literally or under the doctrine of equivalents. (ECF No. 209-3 at 1).

The only dispute between the parties relates to the proper interpretation of the claim limitation "analog to digital converter circuit."

Claim 7, on which Claims 8 and 10 depend, recites:

A host unit for wideband digital RF transport, the unit comprising:
a plurality of inputs, each input coupled to receive a broadband RF signal;
a plurality of analog to digital converter circuits, each coupled to a selected one of the plurality of inputs, each analog to digital converter circuit generating a sample stream, wherein each analog to digital converter circuit operating at a sample rate related to a signal bandwidth of its associated broadband RF signal; and
a multiplexer circuit for multiplexing together the plurality of sample streams into one serial bit stream at a fixed bit rate.

'747 Patent at 7:16–28. The Court has construed the phrase “analog to digital converter circuit” to mean a “circuit that accomplishes at least the conversion of an analog input signal to a digital output signal.” (ECF No. 97 at 11).

CommScope accuses the tHost unit in Dali’s tSeries product and the UBiT unit (hdHost module) in Dali’s Matrix product of satisfying the “host unit” limitations of Claims 7, 8, and 10 of the '747 Patent. The host units in Dali’s t-Series and Matrix products contain four analog to digital converter circuits, each of which processes radio frequency signals of different bandwidths. (ECF No. 209-3 at 1). Each analog to digital converter circuit component operates at the same uniform sample rate. (*Id.* at 3–4). After digitalization, a different component, a field-programmable gate array circuit, changes the sample rate. (*Id.*).

Dali contends that because the analog to digital converter circuit component in Dali’s products does not perform the down conversion of the sample rate, Dali’s products do not infringe the '747 Patent. (ECF No. 209-3 at 4). CommScope contends that the '747 Patent explicitly recites the process performed by Dali’s accused products, and that the Court’s construction of “analog to digital converter circuit” did not limit this claim phrase to a single component. (ECF No. 206-1 at 23–25). CommScope contends that the '747 Patent discloses multiple ways in which down conversion can be achieved, including using an analog to digital converter alone, or using an analog to digital converter, operating at a first high sample rate, in combination with a digital down-converter that changes the signal to a lower sample rate. (*Id.*).

The parties agree that the field-programmable gate array circuit component in Dali’s accused devices performs digital down conversion, but disagree as to whether that conversion, considered together with the digitization performed by the analog to digital converter component, satisfies the “analog to digital converter circuit” limitation.

Thus, the issue before the Court is whether the '747 Patent covers only a single-component analog to digital converter circuit that performs digitization and down conversion, or whether the claims may be satisfied by a multi-component analog to digital converter circuit. At oral argument, the parties stipulated that there are no factual disputes as to the issue of literal infringement of the asserted claims of the '747 Patent. (ECF No. 328 at 23–24). The parties agreed that the determination as to literal infringement of the is a matter of law, because a finding that the analog to digital converter circuit limitation requires a single-component circuit necessitates a finding that Dali's accused products do not literally infringe, and a finding that the analog to digital converter circuit limitation may be satisfied by multiple components necessitates a finding that Dali's accused products do literally infringe the asserted claims of CommScope's '747 Patent.

Dali's expert opined that the Court's prior claim construction limits the analog to digital converter circuit claim limitation to a single component because the Court did not adopt CommScope's proposed construction, which explicitly stated that the circuit may include multiple components. (ECF No. 206-1 at 27). However, the Claim Construction Order makes clear that an analog to digital converter circuit is not limited to a single component, as Dali's expert opines. (ECF No. 97 at 9-10).

As the Court stated in the Claim Construction Order, Claim 8, which depends on Claim 7, is particularly instructive. (*Id.*). Claim 8 recites:

The host unit of claim 7, wherein each of the plurality of analog to digital converter circuits comprises one of (1) a single analog to digital converter operating at IF, (2) a dual analog to digital converter circuit operating at baseband, and (3) an analog to digital converter operating at a high sample rate followed by a digital down converter.

'747 Patent at 7:28–34. The plain language of this claim discloses that an analog to digital converter circuit may include a single analog to digital converter, which converts analog signals to digital signals, as well as a digital down converter, which down converts a digital signal to a lower frequency. The use of the open-ended, transitional term “comprises” further discloses that the circuit can have additional unnamed components to perform undescribed functions. *See Vivid Technologies, Inc. v. American Science & Engineering, Inc.*, 200 F.3d 795, 811 (Fed. Cir. 1999). Because an independent claim must be given broader scope than a dependent claim to avoid rendering the dependent claim inconsistent, the Court finds that the analog to digital converter circuit limitations of Claims 7, 8, and 10 are not limited to a single component. *See Dow Chem. Co. v. United States*, 226 F.3d 1334, 1341–42 (Fed. Cir. 2000).

Because the Court finds that the analog to digital converter circuit limitation of the '747 Patent is not limited to a single component, and the parties stipulated that such a finding has the effect of conceding that such a determination necessitates a grant of summary judgment of literal infringement of the asserted claims by Dali's accused products, CommScope's Motion for Partial Summary Judgment that Dali's t-Series and Matrix products infringe Claims 7, 8, and 10 of CommScope's '747 Patent is granted.

b. Dali's '521 Patent

Dali's '521 Patent relates to techniques for reducing distortion caused by amplifiers. '521 Patent at 1:41-2:8. An amplifier in a distributed antenna system increases the strength of signals transmitted by antennas. However, amplified signals are often distorted, and that distortion can interfere with other signals that are close in frequency. *Id.* at 1:61-67. The '521 Patent discloses digital predistortion techniques that claims advantages over previously disclosed

analog techniques, such as the ability to work in a wide range of temperatures and to adjust for changes in power amplifying parameters. *Id.* at 2:24-38.

Dali alleges that CommScope's FlexWave Prism remote units infringe Claims 1–3, 16, and 20 of Dali's '521 Patent. CommScope moves for summary judgment of non-infringement and invalidity as to all asserted claims. Pursuant to the Court's Order on CommScope's Renewed Motion to Strike Dali's Infringement Contentions, CommScope's Motion for Partial Summary Judgment is granted as to non-infringement of Claims 3, 16, and 20 of the '521 Patent by CommScope's FlexWave prism product, because Dali has not provided evidence that establishes a genuine issue of fact as to whether CommScope's accused product satisfies each limitation of Claims 3, 16, and 20.¹ (ECF No. 302). Thus, the only remaining issues on summary judgment relate to Claims 1 and 2 of the '521 Patent.

i. Infringement of Dali's '521 Patent

Claim 1, on which Claim 2 depends, recites:

A method of operating a power amplifier, the method comprising:

initializing the power amplifier;

performing a training phase comprising:

establishing pre-computed distortion contributions based on pre-compensation training feedback signals representative of output of the power amplifier; and

storing the pre-computed distortion contributions in a lookup table; and

performing an operating phase comprising:

switching a controller off to disconnect signal representative of the output of the power amplifier;

accepting an original value that reflects information to be communicated;

generating a digital lookup table key based on the original value;

retrieving from the lookup table, using the digital lookup table key, a

¹ Summary judgment that CommScope does not literally infringe Claims 3, 16, and 20 of the '521 Patent is granted because the Court struck the sections of Dali's infringement contentions that did not satisfy the Local Patent Rules (ECF No. 302 at 6, 10), and Dali did not otherwise present evidence that CommScope's accused product satisfies each limitation of Claims 3, 16, and 20 of the '521 Patent under its theory of literal infringement. Because Dali's infringement theory for claims 16 and 20 under the doctrine of equivalents also relies on the untimely accused "equalizer" feature of CommScope's accused product, and the Court struck that contention as untimely, summary judgment of non-infringement is also granted as to Dali's claims of infringement of Claims 16 and 20 under the doctrine of equivalents. (ECF No. 328 at 25–26).

corresponding pre-computed distortion contribution for the original value;
distorting the original value based on the corresponding pre-computed distortion contribution to obtain a distorted value to pre-compensate for the nonlinear characteristics of the power amplifier; and
wirelessly transmitting a pre-distorted signal based on the distorted value.

'521 Patent at 10:47–11:4. The Court construed “switching a controller off” to mean “switching a controller to a nonoperating state to disconnect the signal representative of the output of the power amplifier,” and found that an infringing product must have at least one “power amplifier” that covers all three method steps of the asserted claims—initializing, performing a training phase, and performing an operating phase. (ECF No. 97 at 24). The parties agreed that the term “the power amplifier” always refers to the same “power amplifier” that is introduced in the preamble. (*Id.* at 8).

CommScope contends that its accused product does not satisfy the “switching a controller off to disconnect signal representative of the output of the power amplifier” and the “training phase” and “operating phase” limitations of Claim 1 of the '521 Patent.

CommScope’s arguments on summary judgment track closely the arguments CommScope asserted in its *Daubert* Motion to Exclude the Opinion of Dr. Kenney, Dali’s expert on infringement. (ECF No. 174). CommScope argued he did not analyze (1) how the accused product practices the switching a controller limitation of Claim 1, (2) how CommScope’s accused product identifies the controller, and (3) why the CommScope controller is switched to a nonoperating state.

On summary judgment, CommScope provides evidence that Dali’s expert identified in CommScope’s accused product a combination of the “toggle switch” and the “logic that actuates the switch” (referred to by Dali’s expert as “control signals”) as constituting the elements that satisfy the switching a controller off limitation of the '521 Patent. (ECF No. 175-2 at A228–

229). CommScope contends that its independent and unrebutted testing confirms that control signals are always being sent to the toggle switch, and that the toggle switch is never in a “nonoperating state.” (ECF No 206-1 at 38).

Dali responds that CommScope’s argument is based on an incorrect application of the parties’ agreed upon construction of the claim term “the power amplifier.” (ECF No. 254-1 at 22). Dali contends that CommScope’s FlexWave Prism product has two amplifiers, and that just because one of the two amplifiers is always in an operating phase does not mean Claim 1 is not infringed. Dali further urges that because Claim 1 uses the open-ended term “comprising,” an infringing embodiment may have more than one power amplifier, so long as a single power amplifier performs all the method steps required to satisfy the power amplifier limitation of Claim 1. Dali further contends that at most CommScope’s independent testing creates a factual dispute. (ECF No. 254-1 at 28).

CommScope contends that its accused products do not practice the “training phase” and “operating phase” limitations of Claim 1 of the ’521 Patent. (ECF No 206-1 at 39–40). CommScope contends that the ’521 Patent does not disclose a system in which the “training phase” and “operating phase” may be performed at the same time, and that fact establishes as a matter of law that its accused product does not infringe.

Dali contends that the ’521 Patent does describe a system in which the training phase and operating phase may be performed at the same time. (ECF No. 254-1 at 23). Dali further contends that even if the Court adopted CommScope’s proposed interpretation of these claim terms, there remains a genuine issue of fact as to whether the training phase and operating phase limitations are satisfied by CommScope’s FlexWave prism product because Dali’s expert opined

that a single power amplifier in CommScope's FlexWave Prism initiates, performs an operating phase, and separately performs a training phase, thus satisfying the claim limitations. (*Id.*).

Thus, the issues on summary judgment as to non-infringement by CommScope's FlexWave Prism of Claim 1 of Dali's '521 Patent are whether a reasonable jury could find that: (1) CommScope's FlexWave Prism product includes a controller that is switched to a "nonoperating state to disconnect signal representative of the output of the power amplifier," and (2) CommScope's FlexWave Prism contains at least one power amplifier that covers all three method steps of initializing, performing a training phase, and performing an operating phase.

As to the switching a controller off and the training phase and operating phase limitations, there is a genuine issue of material fact as to whether CommScope's FlexWave Prism satisfies these limitations. Dr. Kenney, Dali's expert, opines that the field-programmable gate array circuit in the FlexWave Prism product selects between two channels with two separate power amplifiers, and disconnects the feedback from one, such that one of the two power amplifiers is then in an operating phase while the other is in a training phase. (ECF No. 175-2 at A152–A154). Dr. Kenney further opines that the power amplifier in CommScope's product that is accused under Claim 1 is never simultaneously in both a training phase and an operating phase at the same time, but is rather either in a training phase (while the other power amplifier is in the operating phase) or an operating phase (while the other power amplifier is in the training phase). (*Id.*). Dr. Kenney also opined that a toggle switch is constantly receiving control signals that switch one power amplifier to an operating state and the other to a nonoperating state. (*Id.* at A228). Because it is improper for the Court to make credibility determinations or to determine the weight to give expert opinions, the conflict between Dali's and CommScope's experts creates a genuine issue of fact as to whether all claim limitations of Claims 1 and 2 of the '521 Patent are

satisfied. *See Metro. Life Ins. Co. v. Bancorp Servs., L.L.C.*, 527 F.3d 1330, 1339 (Fed. Cir. 2008). Therefore, CommScope's Motion for Partial Summary Judgment that CommScope's FlexWave Prism product does not infringe Claims 1 and 2 of Dali's '521 is denied.

i. Validity of Dali's '521 Patent Under § 102

CommScope contends that various claims of Dali's '521 Patent are invalid under 35 U.S.C. § 102. Because summary judgment of non-infringement has been granted on all of Dali's asserted claims except Claims 1 and 2, only CommScope's anticipation arguments relating to Claims 1 and 2 remain at issue. CommScope contends that the "Bauder," "Khan," "Rafie," and "Wright" prior art references anticipate Claims 1 and 2 of the '521 Patent. CommScope submits the expert report of Dr. Wood as evidence that these claims are anticipated by these prior art references. (ECF No. 206-4 at A4938).

Early in this litigation, CommScope served Interrogatory 16, which requested that Dali specifically identify the elements of Dali's '521 Patent that are not taught by the prior art referenced by CommScope. After a meet and confer, the parties agreed to narrow the scope of Interrogatory 16 to eight prior art references that CommScope alleged anticipate at least one claim of the '521 Patent. Dali responded and identified exemplary limitations not taught by the eight anticipation references. Later, Dali's expert on validity opined that additional limitations, not previously disclosed by Dali, were not taught by the prior art. CommScope moved to strike the sections of Dali's expert report that rely on validity positions that were not disclosed by Dali in response to the parties' agreement concerning Interrogatory 16. (ECF No. 177). The Court denied CommScope's Motion to Strike because CommScope did not prove that the agreement between the parties required Dali to disclose every limitation Dali or its expert would assert. (ECF No. 303).

Relevant to CommScope's Motion for Partial Summary Judgment, Dr. Kenney opines that several limitations in Claims 1 and 2 of the '521 Patent are not taught by the Khan and Rafie references. Because CommScope does not attempt to refute Dr. Kenney's opinions as to anticipation of all limitations by Khan and Rafie, the Court finds that CommScope has not shown by undisputed evidence that Khan and Rafie anticipate the asserted claims of the '521 Patent. Therefore, CommScope's Motion for Partial Summary Judgment is denied as to anticipation of the '521 Patent by Khan and Rafie.

1. Bauder

CommScope contends that its expert on invalidity, Dr. Wood, identifies and explains how U.S. Patent No. 7,203,247 ("Bauder") discloses every limitation of Claims 1 and 2 of the '521 Patent. (ECF No. 206-5 at A5247-62). CommScope contends that Dali's expert disputes only that Bauder does not teach the second half of the phrase "switching a controller off to disconnect signal representative of the output of the power amplifier" limitation. (ECF No. 206-1 at 41). CommScope further contends that the whole point of Bauder's invention is that the feedback loop is only temporarily formed during the training phase, then the loop is disconnected from the look up table during the operating phase when the transmitting chain works alone, and that Dali's expert's testimony to the contrary is not credible. (*Id.*).

Dali provides expert testimony that Claims 1 and 2 are distinguishable from Bauder, because in Bauder the transmit chain and the receive chain are always connected, because the system disclosed by Bauder must, during the operating phase, use the feedback loop created during the training phase to determine a transmit power level, which in turn is used to generate a lookup table key. (ECF No. 206-5 at A1261).

Credibility determinations, the weighing of the evidence, and the drawing of legitimate inferences from the facts are jury functions, not for the Court, whether ruling on a motion for summary judgment or for a directed verdict. *See Anderson*, 477 U.S. at 248. Because of the conflicting expert opinions, the Court finds that CommScope has not provided undisputed proof that Bauder anticipates every limitation of Claim 1 of the '521 Patent. Therefore, CommScope's Motion for Partial Summary Judgment is denied as to anticipation of Claims 1, and 2 by Bauder.

2. Wright

CommScope contends that Dr. Wood identifies and explains how U.S. Patent No. 6,587,514 ("Wright") discloses every limitation of Claims 1 and 2 of the '521 Patent. (ECF No. 206-5 at A5283–356). CommScope contends that Dali's expert disputes only whether Wright anticipates the "initializing the power amplifier" and the "switching a controller off" limitations of the asserted claims. (ECF No. 206-1 at 46).

As to the "switching a controller off" limitation, CommScope contends that Wright discloses a "multiplexer" that a person of ordinary skill in the art would understand as a toggle switch, or controller, and that Wright teaches that the "multiplexer" can be set to "observe." (ECF No. 206-5 at A5299). CommScope further contends that Wright anticipates the "switching a controller off" limitation because Wright discloses a "data capture controller" that has different modes, including a mode that suspends the collection of data. (ECF No. 206-1 at 47).

CommScope has not shown, as a matter of undisputed fact, that Wright teaches the "switching controller off" limitation of the '473 Patent. CommScope shows only that Wright teaches that the controller can be set to "observe" mode, at which time collection of data is suspended. (ECF No. 206-5 at A5299–31). CommScope has not shown that suspending the collection of data amounts to switching the controller off, as disclosed by the '521 Patent.

Because CommScope has not shown, as a matter of undisputed fact, that all limitations of Claim 1 of the '521 Patent are anticipated by Wright, and because Claim 2 depends on Claim 1, CommScope's Motion for Partial Summary Judgment is denied as to anticipation of Claims 1 and 2 by Wright.

c. Dali's '473 Patent

Dali's '473 Patent addresses a common problem with distributed antenna systems. Remote units may become overloaded when wireless subscribers move from one part of a building to another, and particularly when subscribers congregate in one location. '473 Patent at 1:33-37. To resolve this problem, the '473 Patent discloses a distributed antenna system that is configurable to meet changing demands. *Id.* at 3:59-4:8.

i. Validity of Dali's '473 Patent Under § 112

In 2010, Dali filed its patent application. In October 2016, Dali added Claims 6–21 to its pending application. In December 2016, the '473 Patent issued. On February 2, 2018, CommScope filed a petition with the Patent Trial and Appeal Board for *inter partes* review of the '473 Patent, contending that Claims 6–21 are invalid because they are anticipated or rendered obvious by prior art. (ECF No. 207 at A256). In August 2018, the Patent Trial and Appeal Board instituted on CommScope's petition. (*Id.* at A677). Based in part on what Dali stated during *inter partes* review, as well as during claim construction in this case, CommScope argues that the patent does not disclose a configurable host, and that Claims 6–21 are not enabled under 35 U.S.C § 112. (ECF No. 206-1 at 1).

CommScope contends that the specification filed in 2010 and Claims 6–21 are not directed to the same subject matter. CommScope contends that the specification does not disclose or enable a configurable host that creates different subsets of signals for different remote

units, as disclosed by Claims 6–21. (ECF No. 206-1 at 1). CommScope further contends that the specification discloses a system in which each of the remote units receives all the signals, and software inside the remote units then determines which signals are transmitted by the remote unit. CommScope also contends that through the addition of Claims 6 and 11, and through Dali’s comments during claim construction in this case and in the IPR proceedings, Dali disclaimed the configuration disclosed by the specification by stating that the host unit must be operable to create subsets of the incoming signals. (*Id.* at 2–4). In short, CommScope contends that (1) the specification does not disclose or enable a host unit that creates remote-specific subsets of the incoming signals, and (2) Claims 6–21 are not enabled to a daisy-chain topology, a configuration in which remote units are connected to one another in a series. (*Id.* at 2–4).

Thus, the issues before the Court are whether CommScope has shown, as a matter of undisputed fact, that (1) a person of ordinary skill in the art would not understand that the patentee claimed a configurable host unit, (2) a person of ordinary skill in the art could not, without undue experimentation, configure a host unit that creates remote-specific subsets, and (3) a person of ordinary skill in the art could not, without undue experimentation, configure the system disclosed by Claims 6–21 of the ’473 Patent in a daisy-chain topology.

Claim 6, on which Claims 7–10 depend, recites:

A host unit for use in the transport of wireless communications, comprising:
at least one interface to communicatively couple the host unit to at least one signal source;
wherein the host unit is capable of receiving a plurality of downlink signals from the at least one signal source;
at least one interface to communicatively couple the host unit to a plurality of remote units, including at least a first remote unit and a second remote unit;
wherein the host unit is capable of sending a digital representation of any downlink signal it receives to any of the plurality of remote units;
wherein the host unit is configurable to transmit a digital representation of

a first subset of the plurality of downlink signals to the first remote unit and a digital representation of a second subset of the plurality of downlink signals to the second remote unit, the second subset being different than the first subset; and
wherein the host unit is capable of receiving a digital representation of at least one uplink signal from each of the plurality of remote units.

'473 Patent at 13:18-39.

Claim 11, on which claims 12–21 depend, recites:

A system for transporting wireless communications, comprising:
a host unit;
a plurality of remote units, including at least a first remote unit and a second remote unit;
wherein the host unit comprises at least one interface to communicatively couple the host unit to at least one signal source;
wherein the host unit is capable of receiving a plurality of downlink signals from the at least one signal source;
wherein the host unit further comprises at least one interface to communicatively couple the host unit to the plurality of remote units;
wherein the host unit is capable of sending a digital representation of any downlink signal it receives to any of the plurality of remote units;
wherein the host unit is configurable to transmit a digital representation of a first subset of the plurality of downlink signals to the first remote unit and a digital representation of a second subset of the plurality of downlink signals to the second remote unit, the second subset being different than the first subset;
wherein the host unit is capable of receiving a digital representation of at least one uplink signal from the each of the plurality of remote units.

'473 Patent at 13:53-14:21.

The specification of the '473 Patent discloses that a host unit receives a composite signal comprising input from several cellular carriers (e.g., Verizon, T-Mobile, etc., generically described in the specification as “Carriers 1-8”) which can then be transported to a plurality of remotes. *Id.* at 6:39-47. Within the host, software settings determine which remote receives which signals from Carriers 1-8. *Id.* at 6:26-44. Even in a daisy-chain configuration, the specification discloses that individual remotes are capable of selectively forwarding specific

carrier signals, and that this functionality is controlled by the host. *Id.* at 6:63-65. The specification further teaches that the host can be configured to transport “any specific” signal available at the host to “any specific” remote. *Id.* at 7:30-36.

A person of ordinary skill in the art could configure the system disclosed by the ’473 Patent with a host unit that embeds data in its transmissions to the remote units, such that the first remote unit in the daisy chain receives a particular subset of the downlink signals (Carriers 1-4) and transmits this subset, such that the second remote unit in the daisy-chain receives a different subset from the first remote unit (Carriers 1, 2, and 4) and transmits that subset.

Therefore, the Court finds that (1) the plain language of the specification discloses a configurable host, (2) a person of ordinary skill in the art could, without undue experimentation, configure a host unit that creates remote-specific subsets, (3) a person of ordinary skill in the art could, without undue experimentation, configure the system disclosed by Claims 6–21 of the ’473 Patent in a daisy-chained topology without undue experimentation. Because CommScope has not shown, as an undisputed fact, that the asserted claims of the ’473 Patent are not disclosed or enabled, CommScope’s Motion for Partial Summary Judgment is denied as to invalidity of Dali’s ’473 Patent under 35 U.S.C. § 112.

ii. Validity of Dali’s ’473 Patent Under § 101

CommScope also puts forward a very brief argument that Dali’s ’473 Patent is directed to patent-ineligible subject matter under § 101. CommScope contends that Dali’s ’473 Patent is directed to an aspirational goal, a configurable host unit that can create remote-specific subsets and transmit those different subsets to specified remote units configured in star or daisy-chain, or a combination of both topologies. (ECF No. 206-1 at 10). CommScope contends that the claims do not provide any hardware, software, or other means that would enable a person of ordinary

skill in the art to achieve the aspirational goal of a configurable host. CommScope further contends that *Interval Licensing LLC v. AOL, Inc.*, 896 F.3d 1335 (Fed. Cir. 2018) is instructive.

In *Interval Licensing*, the Federal Circuit stated, “a claimed invention must embody a concrete solution to a problem having the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it.” *Id.* at 1343.

Here, the ’473 Patent discloses remotely configurable distributed antenna systems and methods that “are suitable to be employed with distributed base stations, distributed antenna systems, distributed repeaters, mobile equipment and wireless terminals, portable wireless devices, and other wireless communication systems such as microwave and satellite communications.” ’473 Patent at 5:19-24. The claim language, specification, and drawings make clear that the ’473 Patent discloses a distributed antenna system, comprising at least a configurable host unit and a plurality of remote units. ’473 Patent at Fig. 1, 13:19–35. The novel innovation of the ’473 Patent is the configurability of the host unit, which is “capable of sending a digital representation of any downlink signal it receives to any of the plurality of remote units.” *Id.* at 13:28–30. The host unit achieves this end by using the Digital Access Unit software control module, an algorithm operating within the Digital Access Unit monitoring module, and software-programmable Digital Up-Converters and Digital Down-Converters in the Remote Radio Head Units to allow the host unit to transmit remote-specific subsets to specified remote units configured in star, daisy-chain, or a combination of both topologies. *Id.* at 4:9–19, 11:49–63.

CommScope has not shown by undisputed evidence why this means of achieving a configurable host is insufficient to transform the embodied invention of the ’473 Patent from an abstract result. Because CommScope has not satisfied the Court that Dali’s ’473 Patent is

directed to a patent-ineligible subject matter, CommScope's Motion for Partial Summary Judgment is denied as to the invalidity of Dali's '473 Patent under § 101.

iii. Infringement of Dali's '473 Patent

1. Infringement of Claims 9–10, 14–17 of the '473 Patent

Claims 9 and 14 of the '473 Patent recite a host unit “capable of packetizing each digital representation of an uplink signal.” '473 Patent at 13:46–48, 14:27–29. Claims 10 and 16 of the '473 Patent recite a host unit “capable of packetizing each digital representation of an uplink signal in compliance with the Common Public Interface (CPRI) Standard.” *Id.* at 13:49–51, 14:35–38. Claims 15 and 17 depend from Claims 14 and 16 respectively, and, therefore also include the relevant claim limitations.

The parties did not dispute the meaning of the claim term “packetizing” during claim construction in this case. However, during *inter partes* review, Dali took the clear and unambiguous position that “any construction of ‘packetizing’ requires including destination information, such as within a packet header.” (ECF No. 207 at A622). Through these comments, Dali disavowed claim scope, and Dali cannot now assert these claims against host units that are not capable of including destination information in the frames carrying the upstream signals. *See Aylus*, 856 F.3d at 1361–62.

CommScope contends that CommScope's ION-E product does not insert destination information in the frames that are used to transport the upstream signals from the remote units back to the host unit, and therefore also does not do so in a way that complies with standards set out by Common Public Radio Interface. (ECF No. 206-1 at 16-17). CommScope presents evidence that the frames generated by the host unit in CommScope's ION-E product include a

destination field where this information would be located, but that field is always populated with all zeros. (ECF No. 206-3 at A3268–3293).

Dali’s expert opines that the asserted claims only require the host unit be “capable of packetizing” each digital representation of an uplink signal, and that the host unit in CommScope’s ION-E product is capable of making units of data that are sent over a network where the units of data include source or destination information, satisfying the “packetizing” claim limitations. (206-4 at A4566–71 ¶¶ 146-159).

The plain language of the asserted claims only requires that the host unit be “capable of packetizing,” not that each signal must be “packetized.” CommScope has shown only that its product does not “packetize.” Because CommScope does not show, as is required to show non-infringement, that its product is not capable of “packetizing,” CommScope has not demonstrated that no reasonable jury could find that the ION-E product satisfies the “packetizing” limitations. Therefore, CommScope’s Motion for Partial Summary is denied as to non-infringement of Claims 9-10, 14-17 of Dali’s ’473 Patent by CommScope’s ION-E product.

2. Infringement of Claims 6–21 of the ’473 Patent

CommScope contends that in one configuration, in which a host unit is connected to only two remote units in a daisy-chain configuration, CommScope’s ION-E product does not infringe. (ECF No. 206-1 at 11–12). CommScope contends that the ’473 Patent discloses a system in which a remote unit may receive all signals, or a subset of signals, from the host unit and selectively forward a subset of the signals received downstream to a further remote unit. CommScope contends that its ION-E remote units cannot selectively forward signals when they are daisy-chained, and therefore, as a matter of law, the ION-E does not infringe claims 6–21 of the ’473 Patent. (*Id.* at 15–16).

CommScope has provided undisputed expert testimony showing that when the ION-E host unit is connected to only two remote units in a daisy-chain configuration the system does not infringe. However, CommScope has not shown that its ION-E product has ever been utilized in this non-infringing configuration. Further, CommScope does not satisfy its burden to establish non-infringement by showing that one possible configuration of its product does not infringe. CommScope has not shown that the ION-E system cannot be configured in a star configuration or a combination star and daisy-chain configuration, or that in such configurations, the ION-E system does not infringe. Because CommScope has not shown that the ION-E has ever been utilized in a non-infringing configuration, or that the ION-E does not infringe in any other configuration, CommScope has not shown that no reasonable jury could find that its ION-E product infringes Claims 6–21. Therefore, CommScope’s Motion for Partial Summary Judgment that CommScope’s ION-E product does not infringe Claims 6–21 of Dali’s ’473 Patent is denied.

d. CommScope’s ’402 Patent Family

U.S. Patent Nos. 7,639,982 (“’982 Patent”); 8,326,218 (“’218 Patent”); 8,577,286 (“’286 Patent”); and 9,332,402 (“’402 Patent”) (collectively, “the ’402 Patent Family”) are each entitled “Point-to-Multipoint Digital Radio Frequency Transport.” The ’402 Patent Family is directed to distributed antenna systems in which a host unit communicates with a plurality of remote units. *See, e.g.*, ’218 Patent at 2:19–34. CommScope alleges that Dali’s t-Series and Matrix products infringe twenty claims of the ’402 Patent Family.

i. Invalidity of CommScope’s ’402 Patent Family Under § 101

Dali contends that under 35 U.S.C. § 101, all twenty of the asserted claims of the ’402 Patent Family are directed to patent-ineligible subject matter, the abstract idea of mathematics.

(ECF No. 209-2 at 5). Dali also contends that Claim 1 of the '982 Patent is representative of the asserted claims of the '402 Patent Family for the purposes of considering invalidity under § 101.

Claim 1 of the '982 Patent recites:

A digital radio frequency transport system, comprising:
a digital host unit; and
at least two digital remote units coupled to the digital host unit, wherein
the digital host unit includes shared circuitry that performs bi-directional simultaneous digital radio frequency distribution of digitized radio frequency signals between the digital host unit and the at least two digital remote units;
wherein the digital host unit digitally sums the digitized radio frequency signals received at the digital host unit.

'982 Patent at 11:56-65. Dali provides evidence that the parties agreed that the phrases “digitally sum(s)” and “digitally summing,” mean “mathematically add[s/ing] digital values.” (ECF No. 209-2 at 1).

Dali contends that, for all asserted claims, the host unit receives a digitized radio signal, signal A, as well as a distinct digitized radio signal, signal B, and adds them together to make $A+B$. (ECF No. 209-2 at 4). Dali further contends that this process, “digital summing,” is the only relevant patented subject matter in the '402 Patent Family.

CommScope contends that Claim 1 of the '982 Patent is not representative of the '402 Patent Family, because the other asserted claims of the '402 Patent Family include additional relevant elements not recited in Claim 1 of the '982 Patent. (ECF No. 255 at 6). CommScope further contends that each of the asserted claims of the '402 Patent Family is directed to more than mathematics. CommScope admits that the process recited by Claim 1 of the '982 Patent includes mathematics, but emphasizes that the specification is directed to the required components and circuitry of a bi-directional transmission system. (ECF No. 255 at 10).

The parties agree that if the Court finds that Claim 1 of the '982 Patent is directed to patent-eligible subject matter under § 101, the other asserted claims are also. Thus, the issue before the Court is whether Dali has shown that Claim 1 of the '982 Patent is directed to patent-eligible subject matter.

As to step one of the *Alice/Mayo* test, the process recited by Claim 1 of the '982 Patent does not disclose simple mathematics, but instead discloses a system for the bi-directional transmission of digital radio frequencies in a point-to-multipoint distributed antenna system. The specification and the claim disclose shared circuitry as well as a process for bi-directional transmission within a distributed antenna system. Because Dali has not shown, as a matter of law, that Claim 1 of the '982 Patent is directed to a patent-ineligible abstract idea, mathematics, Dali's Partial Motion for Summary Judgment is denied as to the invalidity of the asserted claims of CommScope's '402 Patent Family under § 101.

ii. Infringement of CommScope's '402 Patent Family

Dali moves for summary judgment of non-infringement of the asserted claims of the '402 Patent Family based on an interpretation of the claim language that requires an infringing product to digitize the entire radio frequency spectrum. (ECF No. 209-1 at 10). Dali contends that its products digitize radio frequencies on a band-by-band basis, do not digitize the entire radio frequency spectrum, and therefore do not infringe. (*Id.* at 10). Dali provides evidence that its products include a bank of analog filters, one for each frequency band, and that after the signals are sorted by band, parts of each band are not digitized. (ECF No. 217-4 at DA15–17).

CommScope's expert opines that a person of skill in the art would understand that the "radio frequency spectrum" limitation of the asserted claims means the radio frequency bands of

operation; that is, the limited range of radio frequencies on which digital communications are permitted. (ECF No. 257-2 at A7021).

Because of the conflicting expert opinions, and because a plain reading of the claim language does not include the limitations Dali asserts, Dali has not shown that no reasonable jury could find that Dali's products infringe the asserted claims of the '402 Patent Family, either literally or under the doctrine of equivalents. Therefore, Dali's Motion for Partial Summary Judgment that Dali's accused products do not infringe CommScope's '402 Patent Family is denied.

iii. Invalidity of CommScope's '402 Patent Family Under § 112

Dali contends that its products do not infringe, but if the Court finds that a reasonable jury could find that the band-by-band processing performed by Dali's products is within the scope of the asserted claims, the asserted claims of the '402 Patent Family are invalid under § 112, because they do not disclose or enable band-by-band processing. (ECF No. 209-1 at 19–25).

Dali's arguments are based on an interpretation of the claim language that is not supported by the intrinsic record or the plain language of the claim, and amount to claim construction arguments, not arguments concerning invalidity. Because Dali has not shown that the patents in the '402 Patent Family do not include a written description of the claimed invention, or that a person of ordinary skill in the art could not make and use the claimed invention without undue experimentation, Dali's Motion for Partial Summary Judgment is denied as to the invalidity of the asserted claims of CommScope's '402 Patent Family under § 112.

IV. Conclusion

For the foregoing reasons, CommScope's Motion is **GRANTED IN PART** and **DENIED IN PART**, and Dali's Motion is **DENIED**. The Court grants summary judgment that Dali infringes Claims 7, 8, and 10 of CommScope's '747 Patent, and that CommScope does not infringe Claims 3, 16, and 20 of Dali's '521 Patent. Summary judgment is denied on all other grounds.

SO ORDERED.

May 17, 2019.


BARBARA M. G. LYNN
CHIEF JUDGE