UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.,
Petitioner,

v.

NEO WIRELESS LLC,
Patent Owner.

Case IPR2022-01567
Patent 10,447,450

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS

I. INTRODUCTION 1

II. CLAIM CONSTRUCTION 4

III. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD OF SUCCESS THAT ITS REFERENCES TEACH OR RENDER OBVIOUS THE "STARTING TIME-FREQUNCY COORDINATE" FOR SIMILAR REASONS THE BOARD REJECTED A PRIOR PETITION REGARDING THIS SAME PATENT. 8

A. Using A One-Dimensional "Starting Time-Frequency Coordinate" Differs From Using A Separate Starting Time Coordinate And A Starting Frequency Coordinate.....9

B. The Office Distinguished The "Starting Time-Frequency Coordinate" From Attempts To Combine Separate Time And Frequency Coordinates In Its Decision Rejecting The Previous Attempt to Petition For Review.....11

C. Vijayan089, Like The -01486 Combination, Lacks A Single-Dimensional "Starting Time-Frequency Coordinate" (Grounds 1 & 3, All Claims). 13

D. Vijayan475, Like The -01486 Combination, Lacks A Single-Dimension "Time-Frequency Coordinate" (Grounds 2 & 4, All Claims). 18

IV. PETITIONER'S REFERENCES DO NOT TEACH OR RENDER OBVIOUS "N TIME-FREQUENCY RESOURCE UNITS … CONTAINING A SET OF FREQUENCY SUBCARRIERS IN A GROUP OF OFDM SYMBOLS" (ALL GROUNDS, ALL CLAIMS). 29

A. The "Time-Frequency Resource Unit" Spans "A Group Of OFDM Symbols," Which Allows For A Reduction In Control Overhead.....30

Ford Motor Co.
Exhibit 1018
Page 002

B. Vijayan089 Does Not Teach Or Render Obvious A "Time-Frequency Resource Units … Each Unit … In A Group Of OFDM Symbols."..33

C. Vijayan475 Does Not Teach Or Render Obvious A "Time-Frequency Resource Units … Each Unit … In A Group Of OFDM Symbols."..41

V. THE FAILURE OF THE PRIOR OBVIOUSNESS CHALLENGE WEIGHS AGAINST GRANTING THIS FOLLOW-ON CHALLENGE. 45

A. This Petition Used The Denial Of The Prior IPR As A Roadmap.....46

B. The Denial Of The Prior Challenge Is Entitled To Weight. 51

C. Failure Of The Prior Challenge Is Evidence Of Nonobviousness. 54

VI. CONCLUSION.....58

Ford Motor Co.
Exhibit 1018
Page 003

TABLE OF AUTHORITIES

Page(s)

COURT DECISIONS

Abbott Labs. v. Sandoz, Inc.,
544 F.3d 1341 (Fed. Cir. 2008) 28

Amazon.com, Inc. v. Barnesandnoble.com, Inc.,
239 F.3d 1343 (Fed. Cir. 2001) 52, 54

B&H Mfg. v. Foster-Forbes Glass Co.,
26 U.S.P.Q.2d (BNA) 1066,
1993 U.S. Dist. LEXIS 21432 (N.D. Ind. 1993) 52

Beloit Corp. v. Valmet Corp.,
1997 U.S. Dist. LEXIS 21329 (W.D. Wis. July 15, 1997) 54

Custom Accessories, Inc. v. Jeffrey-Allan Indus.,
807 F.2d 955 (Fed. Cir. 1986) 52

In re Dembiczak,
175 F.3d 994 (Fed. Cir. 1999) 56

Farmhand, Inc. v. Anel Eng'g Indus.,
693 F.2d 1140 (5th Cir. 1982) 52

Gillette Co. v. S.C. Johnson & Son, Inc.,
919 F.2d 720 (Fed. Cir. 1990) 52

Harris Corp. v. Fed. Express Corp.,
502 Fed. Appx. 957 (Fed. Cir. 2013) 58

Interconnect Planning Corp. v. Feil,
774 F.2d 1132 (Fed. Cir. 1985) 57

Jenn-Air Corp. v. Modern Maid Co.,
499 F. Supp. 320 (D. Del. 1980) 52

Ford Motor Co.
Exhibit 1018
Page 004

Johnson Steel St. Rail Co. v. William Wharton Jr. & Co.,
152 U.S. 252 (1894).....53

Mast, Foos & Co. v. Stover Mfg. Co.,
177 U.S. 485 (1900)..... 54, 57

Mendenhall v. Cedarapids, Inc.,
5 F.3d 1557 (Fed Cir. 1993) 51, 53

Multi-Tech Sys., Inc. v. Hayes MicroComputer Prods., Inc.,
800 F. Supp. 825 (D. Minn. 1992).....52

PPC Broadband, Inc. v. Corning Optical Commns. RF, LLC,
815 F.3d 734 (Fed. Cir. 2016) 54

Radio Corp. of Am. v. Radio Eng'g Labs.,
293 U.S. 1 (1934).....51

Sensonics, Inc. v. Aerosonic Corp.,
81 F.3d 1566 (Fed. Cir. 1996) 56

Stevenson v. Sears, Roebuck & Co.,
713 F.2d 705 (Fed. Cir. 1983) 52

Supernus Pharms., Inc. v. TWi Pharms., Inc.,
265 F. Supp. 3d 490 (D.N.J. 2017),
aff'd, 747 Fed. Appx. 852 (Fed. Cir. 2018).....53

W.L. Gore & Assocs., Inc. v. Garlock, Inc.,
721 F.2d 1540 (Fed. Cir. 1983) 56

AGENCY DECISIONS

Abiomed, Inc. v. Maquet Cardiovascular, LLC,
IPR2017–02150, Paper 11 (Mar. 12, 2018) 46

Code200, UAB v. Bright Data Ltd.,
IPR2022-00861, Paper 18 (Aug. 23, 2022) (precedential)..... 48, 50, 55

Ford Motor Co.
Exhibit 1018
Page 005

Coherus Biosciences, Inc. v. Hoffman-La Roche Inc.,
IPR2017-02066, Paper 11 (Mar. 9, 2018) 41

Dell Computer, Inc. v. Neo Wireless LLC,
IPR2021-01468, Paper 12 (Mar. 14, 2022) 3

Dell Computer, Inc. v. Neo Wireless LLC,
IPR2021-01486, Paper 10 (Mar. 16, 2022) 1, 3, 11, 12, 17, 46, 51

Denso Corp. v. Collision Avoidance Techs. Inc.,
IPR2017-01715, Paper 7 (Jan. 23, 2018) 41

Ericsson Inc. v. Uniloc 2017, LLC,
IPR2019-01550, Paper 8 (Mar. 17, 2020) 49

Facebook, Inc. et al. v. Uniloc USA, Inc. et al.,
IPR2017-01524, Paper 7 (Dec. 4, 2017) 40

General Plastic Co., Ltd. v. Canon Kabushiki Kaisha,
IPR2016-01357, Paper 19 (Sep. 6, 2017)
(precedential (§ II.B.4.i)) 45, 48, 55

Synaptics, Inc. v. Amkor Tech, Inc.,
IPR2017-00085, Paper 12 (Apr. 18, 2017).....47

Valve Corp. v. Electronic Scripting Products, Inc.,
IPR2019-00062, Paper 11 (Apr. 2, 2019).....49

STATUTES

35 U.S.C. § 314(a) 3, 45

RULES

Consolidated Trial Practice Guide 4, 45

MPEP § 2141(II)(C).....55

Ford Motor Co.
Exhibit 1018
Page 006

TREATISES

MOORE'S FED. PRAC. § 131.30[2][c][ii] (2000) 53

Ford Motor Co.
Exhibit 1018
Page 007

EXHIBIT LIST	
2001	Declaration of William P. Alberth, Jr. [Alberth Decl.]
2002	William P. Alberth, Jr. Curriculum Vitae [Alberth-CV]
2003	In re Neo Wireless, LLC Patent Litigation, 2:22-MD-03034-TGB, Joint Claim Construction Statement [Joint-CC-Statement]
2004	In re Neo Wireless, LLC Patent Litigation, 2:22-MD-03034-TGB, Exhibit A - Agreed Litigation Terms [Agreed-Lit.-Terms]
2005	In re Neo Wireless, LLC Patent Litigation, 2:22-MD-03034-TGB, Exhibit B - Disputed Litigation Terms [Disputed-Lit.-Terms]
2006	In re Neo Wireless, LLC Patent Litigation, 2:22-MD-03034-TGB, Notice of Stipulation Regarding Claim Construction [Stip-Re-CC]
2007-2013	Reserved
2014	Apr. 19, 2019 Letter from Sen. Tillis & Sen. Coons to USPTO Director [Tillis & Coons Ltr.]

Ford Motor Co.
Exhibit 1018
Page 008

I. INTRODUCTION

This is the second petition for *inter partes* review of claims 1–18 of U.S. Patent 10,477,450 (the "'450 patent"). Institution of IPR2021-01486 (the "-01486 IPR") was denied on the merits on March 16, 2022—approximately half a year before the present petition was filed—because the Board panel found in that case that "the asserted combination fails to teach or suggest the recited 'segment of time-frequency resource . . . having a starting time-frequency coordinate and . . . comprising N time-frequency resource units.'" IPR2021-01486, Paper 10 ("-01486-DDI"), 26. This new Petition should be rejected for similar reasons.

First, much as with the -01486 IPR's asserted combination, neither of the primary references in this Petition, Vijayan089 (Grounds 1 and 3) and Vijayan475 (Grounds 2 and 4), disclose or render obvious "a starting time-frequency coordinate." Rather, Vijayan089 and Vijayan475 use ***both*** a starting time coordinate ***and*** a separate starting frequency coordinate. Because they use two separate starting coordinates rather than the single claimed "starting time-frequency coordinate," they do not offer the specific benefit of the innovative reduction in control overhead taught by the '450 patent. Moreover, using two separate starting coordinates also fails to meet the undisputed meaning of "starting time-frequency coordinate" that requires it to be "one-dimensional."

Ford Motor Co.
Exhibit 1018
Page 009

Second, even if *arguendo* Vijayan089 and Vijayan475 ***were*** found, unlike the art raised in the -01486 IPR, to teach a "time-frequency resource unit," they still do not disclose or render obvious "each unit containing a set of frequency subcarrier in a group of OFDM symbols." The alleged "time-frequency resource unit" taught by Vijayan089 and Vijayan475 covers only a ***single*** OFDM symbol. By using only a single OFDM symbol, these references again straightforwardly fail to meet a claim limitation. Unsurprisingly, and relatedly, they likewise fail to produce the '450 patent's increased overhead efficiency created by a "time-frequency resource unit … in a ***group*** of OFDM symbols,"[1] opting instead to allow for more flexibility in allocating resources. Thus, they teach directly away from the nonobvious choices made by the inventors of the challenged claims of the '450 patent.

Finally, this second Petition, which follows a rejected obviousness challenge in the first petition, and improperly relies upon the denial of the first petition as a hindsight roadmap for its own grounds, further supports a finding that Petitioner has not met its burden to show a reasonable likelihood of showing obviousness.

The selected technical arguments presented in this Response, while themselves sufficient in view of the other evidence in the record to show that the

[1]All emphasis added unless otherwise noted.

Ford Motor Co.
Exhibit 1018
Page 010

Petition does not meet the criteria for institution, are still further supported by the expert testimony of Mr. Alberth (Ex. 2001).[2]

For the reasons summarized above, as further detailed below, the institution of a trial based on the Petition should be denied under 35 U.S.C. § 314(a) and the binding precedent of the Office and courts.

---

[2] William Alberth is a proven and credible expert in this field. Ex. 2002 (*curriculum vitae* of Mr. Alberth). In the IPR on a related patent the decision denying review repeatedly found persuasive and credited Mr. Alberth's testimony in rejecting the merits of that petition's grounds. *See Dell Computer, Inc. v. Neo Wireless LLC*, IPR2021-01468, Paper 12 (Mar. 14, 2022), at, *e.g.*, 31 ("we find persuasive the declaration testimony of Mr. Alberth"), 32-33 ("we credit the expert declaration testimony of Mr. Alberth"), 45 ("Here, we find persuasive the declaration testimony of Patent Owner's expert, Mr. Alberth") ; *see also Dell Computer, Inc. v. Neo Wireless LLC*, IPR2021-01486, Paper 10, at 25-26 (Mar. 16, 2022) (denying institution on merits of obviousness ground previously raised against '450 patent-at-issue here, accepting arguments "support[ed]" by, *inter alia*, "Mr. Alberth's declaration"). The Board should consider Mr. Alberth's opinions, find them more credible than Petitioner's positions, and reject these grounds too.

Ford Motor Co.
Exhibit 1018
Page 011

II. CLAIM CONSTRUCTION

The Consolidated Trial Practice Guide notes that in construing the claims "the Board may take into consideration statements made by a patent owner or petitioner about claim scope," and that claim construction developments in district court may be taken into account in this proceeding when made of record by the parties. Consolidated Trial Practice Guide, 46-48. While Petitioner proposes no construction beyond plain meaning in this proceeding (Pet., 18-19) the story is quite different in the ongoing district court proceedings co-pending with this case. In related multi-district litigation, *In re NEO Wireless, LLC Patent Litigation*, numerous terms have been subject to the Court's claim construction confer and briefing process, in which Petitioner agreed to participate and has participated. The parties have proposed numerous formal constructions of claim terms of the patent-at-issue in this case, though Petitioner has attempted to dissociate itself from the claim construction positions it participated in developing.

As noted in the Petition and the parties' mandatory notices, prior to the filing of the Petition, Patent Owner initiated district court proceedings enforcing the patent-at-issue against several alleged infringers, including Petitioner. *See* Pet., 3-4. Petitioner is among nine defendants who submitted terms for construction pursuant to the Court's scheduling order. *See* Ex. 2003 [Joint-CC-Statement] 1, 5-6. Petitioner collaborated with its co-defendants and participated in the meet and

Ford Motor Co.
Exhibit 1018
Page 012

confer negotiations with respect to these terms. When the parties submitted the constructions to the Court, Petitioner added footnotes suggesting that it "do[es] not take a position on the constructions." *See* Ex. 2004 [Agreed-Lit.-Terms] 1, n. 1 ("Volkswagen Grp. of Am., Inc. and Volkswagen Grp. of Am. Chattanooga Operations, LLC, do not take a position on the proposed constructions for any of the Agreed Claim Terms."), 2005 [Disputed-Lit-Terms] 1, n. 1 ("Volkswagen Grp. of Am., Inc. and Volkswagen Grp. of Am. Chattanooga Operations, LLC, do not take a position on the proposed constructions for any of the Disputed Claim Terms.").

Patent Owner disputed Petitioner's last-minute attempt to disavow its fellow Defendants' proposed claim constructions that it helped develop. *Id.*, 1 n.2. After meeting and conferring, Petitioner stipulated in the District Court that it waives its rights to challenge those constructions, in that Court or in this proceeding, including on appeal. Ex. 2006 [Stip-Re-CC]. In effect, Petitioner has acquiesced to the claim constructions put forth and agreed to by its co-defendants. Moreover, Petitioner's gameplaying cannot change the fact that its fellow accused infringers, which include FCA US LLC, Mercedes-Benz USA LLC, Tesla Inc., Ford Motor Co., Nissan North America Inc., Toyota North America Inc., General Motors Co., and American Honda Motor Co., assert in open court that these are the correct constructions of these terms of the patent's claims-at-issue.

Ford Motor Co.
Exhibit 1018
Page 013

All the parties agree, and Petitioner agrees not to challenge, that "time-frequency coordinate," which applies to all claims, should be construed as "one-dimensional time-frequency coordinate." Ex. 2004 [Agreed-Lit.-Terms] 5. The parties agree that, with respect to independent claim 7 and its dependent claims, the preamble is limiting and should be given its plain and ordinary meaning. *Id.*, 2. Finally, the parties agree, with respect to dependent claim 11, that "wherein modular coding is applied to the time-frequency resource units in the segment of time-frequency resource" should be construed as "wherein a modular coding scheme is applied to the time-frequency resource units in the segment of time-frequency resource." *Id.*, 5.

Additionally, Patent Owner and the defendants disagree as to the construction of "time-frequency resource unit," which applies to all claims. The parties' constructions for this term are as follows:

Proposed Construction of Plaintiff (Patent Owner)	**Proposed Construction of Defendants**
Plain and ordinary meaning. No construction necessary.	"a combination of time and frequency units designed according to the application requirements of the application that is being grouped"

Ex. 2005 [Disputed-Lit-Terms] 3. The Petition made no attempt to apply the Defendants' proposed litigation construction for "time-frequency resource unit for any of its grounds. *See* Pet., 44-48 (Grounds 1 and 3 relying on Vijayan089), 74-

Ford Motor Co.
Exhibit 1018
Page 014

80 (Grounds 2 and 4 relying on Vijayan475). By contrast, Patent Owner, both here and in the District Court, has consistently asserted that no construction is necessary for "time-frequency resource unit" and the term should be given its plain and ordinary meaning.[3] *See* Ex. 2005 [Disputed-Lit-Terms] 3.

[3] Indeed, the Defendants' proposed construction for this term appears to stem from an improper reading of Patent Owner's remarks in IPR2021-01486, wherein Patent Owner described an exemplary embodiment in the specification of the '450 Patent that called for designing time-frequency resource units based on similarities of resource requirements when grouping packet streams based on application type. For the avoidance of doubt, Patent Owner did not then, and does not here, propose to limit the term "time-frequency resource unit" to that particular embodiment. As the patent specification expressly states, other types of grouping are envisioned. *See, e.g.*, Abstract, Fig. 7, Col 2:45-3:24, 8:37-9:3, 12:10-45. Moreover, in this case (as in the prior IPR) the specific scope of the invention with regard to the types of resource groupings does not need to be addressed for purposes of Patent Owner's preliminary response to the petition.

Ford Motor Co.
Exhibit 1018
Page 015

III. THE PETITION FAILS TO ESTABLISH A REASONABLE LIKELIHOOD THAT ITS REFERENCES TEACH OR RENDER OBVIOUS THE "STARTING TIME-FREQUNCY COORDINATE" FOR REASONS SIMILAR TO REASONS THE BOARD REJECTED A PRIOR PETITION AGAINST THE SAME CLAIMS.

The '450 patent's challenged claims recite "a segment of time-frequency resource, the segment having a starting time-frequency coordinate and the segment comprising N time-frequency resource units within a time interval." Ex. 1001 ['450 Patent] cls. 1, 7, 13. The "starting time-frequency coordinate" goes to the heart of the claimed invention's benefits of reducing the amount of control overhead used in the system. *See* Section III.A *infra*. The Office has already rejected another petition directed against the same patent and claims because it attempted to combine two separate parameters into the claimed "starting time-frequency coordinate." *See* Section III.B *infra*. Here, Petitioner again improperly attempts to, in effect, draw a box around two different parameters and label them a "starting time-frequency coordinate." Vijayan089, for Grounds 1 and 3, uses both "a starting subband and symbol period," which Petitioner improperly attempts to combine into a single parameter. *See* Section III.C *infra*. Similarly, Vijayan475 specifies the start of its slot with two parameters – the start offset, which acts as a starting time coordinate, and the slot info, which specifies the starting frequency coordinate. *See* Section III.D *infra*. Since none of the references in the Petition,

Ford Motor Co.
Exhibit 1018
Page 016

alone or in combination, teach a single "starting time-frequency coordinate" as claimed, institution should be denied.

A. Using A One-Dimensional "Starting Time-Frequency Coordinate" Differs From Using A Separate Starting Time Coordinate And A Starting Frequency Coordinate.

The '450 patent describes several innovations that together allow for a reduction in overhead when allocating time-frequency resources. The use of a single "starting time-frequency resource" is one of these innovations, required by all the claims and recited in each independent claim. Ex. 1001 ['450 Patent] cls. 1, 7, 13. In the background of invention the '450 explains that, in the prior art the invention improved upon:

> The resource allocation is identified in the time domain scale with a ***start symbol offset*** (8 bits) and a symbol length (7 bits) and in the frequency domain scale with a ***start logical subchannel offset*** (6 bits) and a number of allocated subchannels (6 bits).

Id., 1:62-66. The "start symbol offset" and the "start logical subchannel offset" were both needed to specify the start of the time/frequency region. *See id*. As Mr. Alberth explains, this differs from the claimed invention:

> The '450 describes the prior art resource allocation as being specified with the start symbol offset, symbol length, start logical subchannel offset, and number of allocated subchannels. Ex. 1001 ['450 Patent] 1:62-66. Since the "start symbol offset" specified the starting location in the time domain, it defined a starting time coordinate. Similarly,

Ford Motor Co.
Exhibit 1018
Page 017

> since the "start logical subchannel offset" specified the starting location in the frequency domain, it defined the starting frequency coordinate. By contrast, as I explained above, the '450 patent combines these two separate parameters into a single "starting time-frequency coordinate." *See id.*, 7:10-27, FIG. 6. For example, FIG 6. uses a "starting time-frequency coordinate" VZI_2=1 to specify where V_2 starts in both time and frequency. *Id.*, FIG. 6. This one "starting time-frequency coordinate" combines time and frequency into a single dimension.

Ex. 2001 [Alberth Decl.] ¶ 57. Thus, a "POSITA would have understood the claimed 'starting time-frequency coordinate' to be different from and exclude the collective labeling of a starting time coordinate and a separately described starting frequency coordinate." *Id*.

In related litigation, all the parties agreed that the claimed "time-frequency coordinate" should be construed as a "one-dimensional time-frequency coordinate." Ex. 2004 [Agreed-Lit-Terms] 5. Petitioner has agreed not to challenge this construction. Ex. 2006 [Stip-Re-CC] 2. It is thus undisputed that the "starting time-frequency coordinate" must have a single dimension covering both time and frequency. Any reference that uses ***both*** a starting time coordinate ***and*** a separate starting frequency coordinate does not have a one-dimensional coordinate in both time and frequency. *See* Ex. 2001 [Alberth Decl.] ¶ 57.

Ford Motor Co.
Exhibit 1018
Page 018

B. The Office Distinguished The "Starting Time-Frequency Coordinate" From Attempts To Combine Separate Time And Frequency Coordinates In Its Decision Rejecting The Previous Attempt to Petition For Review.

In IPR2021-01486 Dell challenged this same patent arguing that all the claims were obvious based on a combination of Kim (US 2005/0157803) (Ex. 1015) and the 2004 version of the IEEE 802.16 ("Kim-IEEE802.16-2004") (Ex. 1016). IPR2021-01486, Paper 3 ("-01486 Petition"), 9. The Board denied Dell's petition, based importantly on the fact that the combination did not teach or render obvious the recited "segment of time-frequency resource … having a starting time frequency coordinate and … comprising N time-frequency resource units." -01486-DDI, 26.

The -01486 Petition attempted to treat the "start symbol offset" and the "start logical subchannel offset" from Kim-IEEE802.16-2004 "***collectively***" as a single "starting time-frequency coordinate." -01486 Petition, 44 (stating that these two separate parameters are "collectively, the claimed 'starting time-frequency coordinate'"). The -01486 panel soundly rejected this attempt to treat two separate parameters "collectively" as a single "starting time-frequency coordinate." As the panel explained in denying institution, "we find that such contentions are premised on Petitioner and its declarant's ***conclusory conflation of … separate starting time and frequency coordinates*** as the recited singular 'starting time-frequency

coordinate.'" -01486-DDI, 27. Thus, it correctly agreed with Patent Owner and Mr. Alberth's explanation that one cannot convert two separate parameters into one simply by referring to them collectively. *See* IPR2021-01486 Paper 7, 15 ("The patent does not define 'time-frequency coordinate' to mean the combination of an independent time coordinate and an independent frequency coordinate in this, or any other, passage.") (citing Ex. 2001 [Alberth Decl.] ¶ 52).

Despite the non-institution of the -01486 Petition, this second Petition challenging the same claims commits the same error. Like the petitioner in that case, this Petitioner again attempts to treat separate time and frequency parameters "collectively." *Compare* Pet., 76 ("Vijayan475's 'Start Offset' and 'Slot Info' parameters ***collectively*** identify a starting time-frequency coordinate.") *with* -01486 Petition, 44 ("***collectively***, the claimed 'starting time-frequency coordinate'"). Like the -01486 petition's rejected arguments, the arguments in this petition are premised once again on "Petitioner and its declarant's ***conclusory conflation of … separate starting time and frequency coordinates*** as the recited singular 'starting time-frequency coordinate.'" *Compare* -01486-DDI, 27. These grounds should therefore be rejected as well.

Ford Motor Co.
Exhibit 1018
Page 020

C. Vijayan089, Like The -01486 Combination, Lacks A Single-Dimensional "Starting Time-Frequency Coordinate" (Grounds 1 & 3, All Claims).

Much like in the -01486 Petition, this Petition in effect draws a box around two separate, one-dimensional coordinates in Vijayan089 and asserts that they "collectively" constitute a single "starting time-frequency coordinate." Petitioner asserts that this limitation is met by Vijayan089's "starting subband and symbol period." Pet., 45 ("The 'start of the segment' parameter (e.g., the starting subband ***and*** symbol period) discloses the claimed 'starting time-frequency coordinate.'"). The Petition gives a purported example of this alleged "starting time-frequency coordinate": arguing that, "Segment 734 includes a starting time-frequency coordinate of: Symbol Period = 4, Subband Group = 2." *Id.*, 47 (*citing* Ex. 1005 [Vijayan089] ¶ 73 ("PLC 2 is assigned a segment 734 containing 4 slots from subband group 2 in symbol period 4 through subband group 2 in symbol period 5.")).

Attempting to justify this latest collective read of multiple coordinates on the claimed time-frequency coordinate, the Petition emphasizes that Vijayan089 refers to the starting subband and symbol period collectively as the "start of segment" parameter. Pet., 45 *citing* Ex. 1005 [Vijayan089] ¶ 74. It is, however, clear that the "start of the segment" is composed of two individual sub-parameters. Ex. 1005

Ford Motor Co.
Exhibit 1018
Page 021

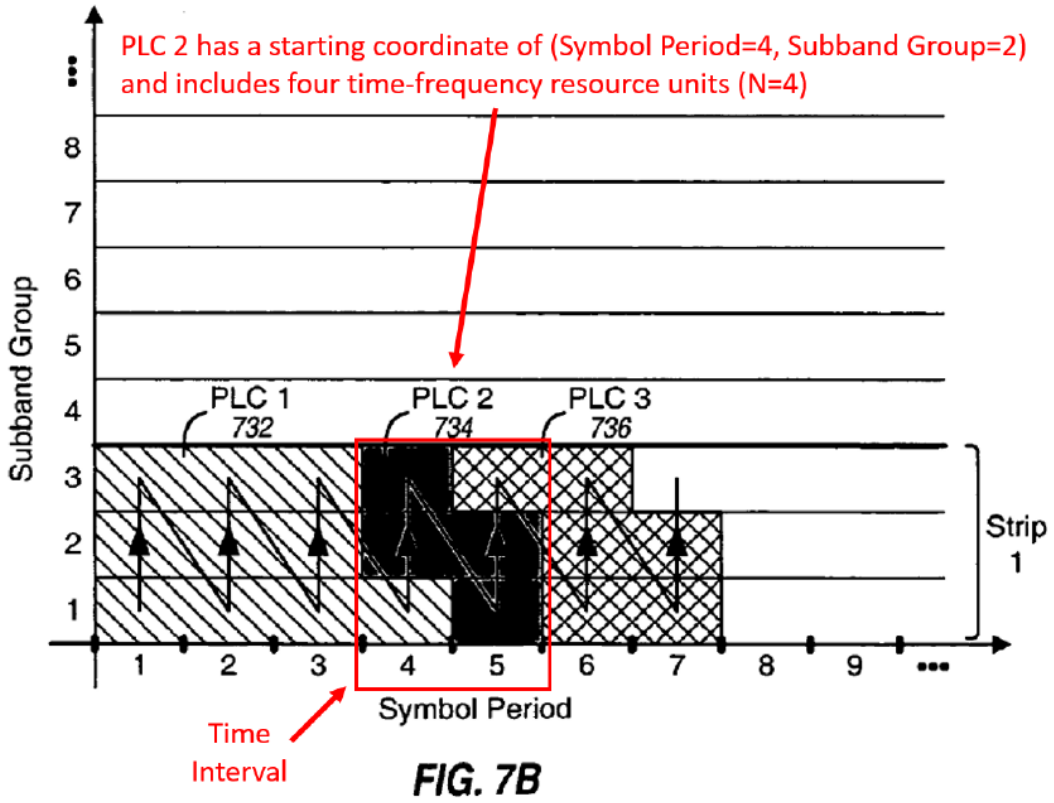
[Vijayan089] ¶ 74 ("the start of the segment (which may be given by the starting subband ***and*** symbol period)"). As explained by Mr. Alberth:

> Vijayan089's "starting subband" describes the location of the start of the segment in the frequency domain. Thus, it is a starting frequency coordinate. Similarly, the starting "symbol period" describes where the segment begins in the time domain. It is thus a starting time coordinate.

Ex. 2001 [Alberth Decl.] ¶ 58. Thus, Vijayan089 is like the 802.16 reference in the '450 patent's background, in that it has both a starting time coordinate and a separate starting frequency coordinate. *See id.* "The fact that Vijayan089 refers to the 'starting subband and symbol period' together as the 'start of the segment' does not change the fact that they are two separate parameters with one only in the time domain and the other only in the frequency domain." *Id.*

The fact that Vijayan069's starting subband and symbol period are distinct parameters is made even more clear by the Petition's own description of Vijayan089's example. The Petition describes the start of segment 734 in Figure 7B as being specified by "Symbol Period = 4, Subband Group = 2." Pet., 47 *citing* Ex. 1005 [Vijayan089] ¶ 73. The Petition further reinforces this point with the annotation Petitioner added to Figure 7B, which states, "PLC 2 has a starting coordinate of (Symbol Period=4, Subband Group=2)." *Id.*, 46.

Ford Motor Co.
Exhibit 1018
Page 022



Id. (annotating Figure 7B from Ex. 1005 [Vijayan089]).

Petitioner is correct in using two separate starting coordinates to describe the start of the segment:

> Vijayan089 describes segment 734 in Figure 7B, saying that "PLC 2 is assigned a segment 734 containing 4 slots from subband group 2 in symbol period 4 through subband group 2 in symbol period 5." Ex. 1005 [Vijayan089] ¶ 73. Here, Vijayan089 is specifying symbol period 4 as the starting time coordinate since that is the location in the time dimension of the first slot in the segment. Similarly, Vijayan089 specifies subband group 2 as the starting frequency coordinate since that is where segment 734 starts in the frequency dimension. This is

> indeed how Dr. Wilson's annotation to Figure 7B, which states, "PLC 2 has a starting coordinate of (Symbol Period=4, Subband Group=2)." Ex. 1003 [Wilson Decl.] ¶ 149. By using two separate parameters, one for the symbol period and another for the subband group, Dr. Wilson is, in effect, stating that Vijayan089 discloses uses both a separate starting time coordinate and starting frequency coordinate.

Ex. 2001 [Alberth Decl.] ¶ 59. But the fact that Vijayan089 refers to these two starting coordinates as a single "parameter" does not transform them into the claimed "starting time-frequency coordinate," any more than the -01486 Petition transformed the separate coordinates in its reference by treating them "collectively" and asserting them to be the claimed "starting time-frequency coordinate."

The Petition's arguments with respect to Vijayan089 are materially similar to the arguments that were previously rejected in the -01486 Petition. Similar to this Petition, the -01486 Petition also attempted to merge Kim-IEEE802.16-2004's "OFDMA Symbol offset" and "subchannel offset" collectively into the claimed "time frequency-coordinate." *See e.g.*, IPR2021-01486 Pet., 47 ("In the Kim-IEEE802.16-2004 network, a data region (the claimed 'segment') . . . is transmitted with (i) a 'starting time . . . coordinate' . . . and (ii) a 'starting . . . frequency coordinate' . . . (***collectively***, the claimed 'starting time-frequency coordinate')."), 60 ("the starting time frequency coordinate (e.g., the 'OFDMA Symbol offset' ***and***

Ford Motor Co.
Exhibit 1018
Page 024

'subchannel offset' (as specified in IEEE802.16-2004))"). This argument was rejected, and the similar argument here should also be rejected.

While Vijayan089, unlike the Kim-IEEE802.16-2004 combination used in the prior petition, refers to "starting subband" and the "starting symbol period" together as the "start of the segment," that does not change the underlying fact that they are two separate starting coordinates—one in frequency and one in time. Just as the Board found in denying the -01486 IPR, the Petitioner's arguments are "premised on Petitioner and its declarant's conclusory conflation of … separate starting time and frequency coordinates as the recited singular 'starting time-frequency coordinate.'" -01486-DDI, 27. Fundamentally, Vijayan089 is just more of the same.

Another reason that the "start of segment" in Vijayan089 fails to qualify as a "starting time-frequency coordinate"— beyond it being simply a repeat of an argument already rejected by the Board—is that it has more than one dimension. As discussed above, all the Defendants in related litigation agree that a "time-frequency coordinate" is a "one-dimensional time-frequency coordinate." Ex. 2004 [Agreed-Lit-CC] 5. Petitioner has agreed not to challenge this construction. Ex. 2006 [Stip-Re-CC]. According to the Petition's own description, the starting coordinate has dimensions of both time (symbol period) and frequency (subband group). *See* Pet., 46 ("PLC 2 has a starting coordinate of (Symbol Period=4,

Ford Motor Co.
Exhibit 1018
Page 025

Subband Group=2)."), 47 ("Segment 734 includes a starting time-frequency coordinate of: Symbol Period = 4, Subband Group = 2."). This is in contrast to, for example, the time-frequency coordinate in the '450 patent's Figure 6. *See* Ex. 1001 Fig. 6, 7:10-27 ("For example, an index VZI_1, VZI_2, … VZI_m is shown at the origin of each segment that is contained in the zone."); *see also* Ex. 2001 [Alberth Decl.] ¶ 33 (describing how Figure 6 "defines where a packet stream's associated time-frequency resource segment (V_m) starts in a zone both in time *and* frequency."). Vijayan089's "start of segment," even if it were to be considered a single starting coordinate, is not a "starting ***time-frequency coordinate***" because it does not satisfy the undisputed requirement that a "time-frequency coordinate" be "one dimensional."

Thus Grounds 1 and 3, relying on Vijayan089, cannot be a basis for institution.

D. Vijayan475, Like The -01486 Combination, Lacks A Single-Dimension "Time-Frequency Coordinate" (Grounds 2 & 4, All Claims).

The Petition asserts that "Vijayan475's 'Start Offset' and "Slot Info' parameters collectively identify a starting time-frequency coordinate." Pet., 76. It further states that, "Vijayan475 also discloses a ***second way*** to convey this information to reduce overhead signaling. … This encoding uses "ΔStart" and "ΔMax" parameters along with the Min Slot parameter as seen in Figure 4 to

convey the starting time-frequency coordinate." *Id.*, 77. Petitioner's argument is as flawed as the arguments above. Each of these reads attempts to artificially combine multiple parameters in different dimensions into the single claimed "starting time-frequency coordinate." As discussed above, labeling multiple parameters with different dimensions collectively as a "starting time-frequency coordinate" was rejected by the Board panel in the -01486 case, and should similarly be rejected here.

Vijayan475 does indeed identify multiple ways to assign its slots (the alleged "time-frequency resource") to a given MLC (presumably what Petitioner identifies as the alleged "signal containing information"). *See e.g.*, Ex. 1006 [Vijayan475] ¶ 42 ("The parameters used to describe the slots assigned to each active MLC are typically dependent on the scheme used to assign the slots."). For example, when Vijayan475 uses a rectangular slot pattern, the four parameters are the same as those described in the background of the '450 patent. *Compare* Ex. 1006 [Vijayan475] ¶ 42 ("For example, if each active MLC is assigned a rectangular pattern, then this pattern may be described by two corners, e.g., the slot index and symbol period index for the lower left corner of the pattern and the slot index and symbol period index for the upper right corner of the pattern.") *with* Ex. 1001 ['450 patent] 1:62-66 ("The resource allocation is identified in the time domain scale with a start symbol offset (8 bits) and a symbol length (7 bits) and in

Ford Motor Co.
Exhibit 1018
Page 027

the frequency domain scale with a start logical subchannel offset (6 bits) and a number of allocated subchannels (6 bits).”). As explained by Mr. Alberth:

> In Vijayan475’s rectangular pattern, its “slot symbol period” is a starting time coordinate and its “slot index” is a separate starting frequency coordinate. *See* Ex. 1006 [Vijayan475] ¶ 42. This is much like the background art discussed in the ’450 patent where the “start symbol offset” was the starting time coordinate and the “start logical subchannel offset” was the starting frequency coordinate.

Ex. 2001 [Alberth Decl.] ¶ 60.

When introducing the zigzag pattern shown in Figure 4, Vijayan475 proposes a different method of assigning slots:

> MLC x is assigned slots starting from a start slot index (Start Slot) at a designated symbol period index (Start Offset) and going to a highest slot index (Max Slot), then starting from a lowest slot index (Min Slot) in the next symbol period index and going to the highest slot index, and so on, until the number of slots allocated to MLC x has been reached. For the example shown in FIG. 4, MLC x is assigned 16 slots starting at slot index 4 in symbol period index 3, zigzagging [*sic*] between the lowest slot index 2 and the highest slot index 5, and concluding at slot index 3 in symbol period index 7.

Ex. 1006 [Vijayan475] ¶ 40.

Ford Motor Co.
Exhibit 1018
Page 028

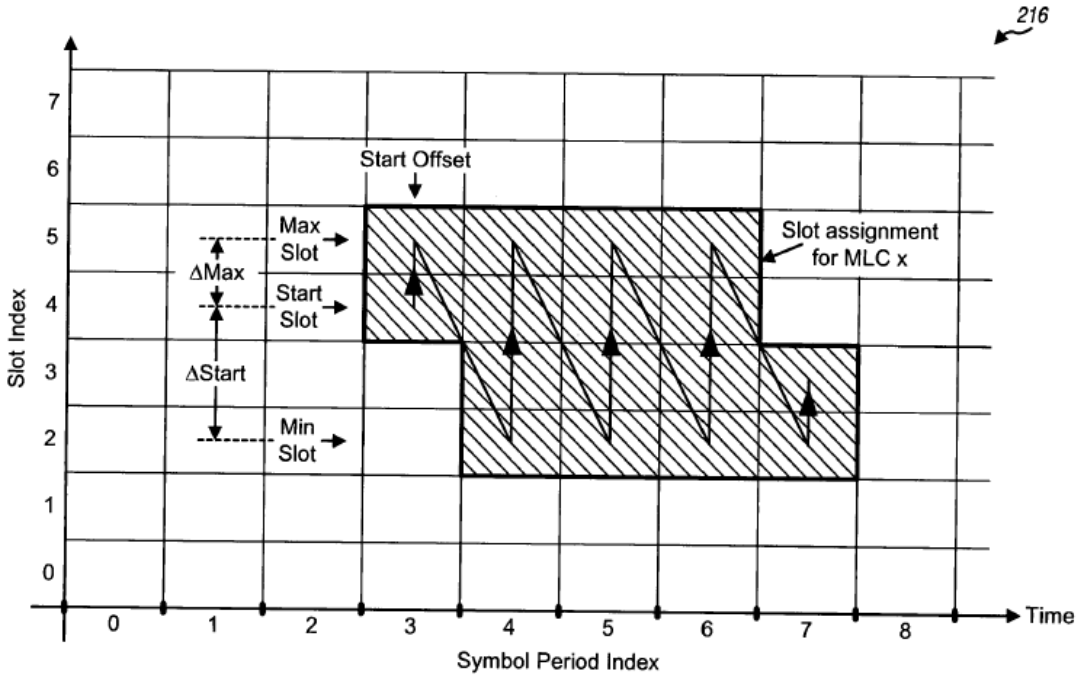


FIG. 4

Id., FIG. 4. As explained by Mr. Alberth, this pattern also uses two parameters to specify its starting slot.

> Vijayan475's Figure 4 and accompanying description illustrate a zigzag pattern of frequency slots over symbol periods of time that is assigned to a MLC. Setting the stage, Figure 4 illustrates that the frequency domain that has been divided into eight units, each with a "Slot Index" starting at 0 and ending at 7. Ex. 1006 [Vijayan475] FIG. 4. The time domain has been divided up into nine units with a "Symbol Period Index" starting at 0 and ending in 8. *Id.* In the zigzag pattern the "symbol period index (Start Offset)" indicates the symbol period in which the MLC should start. *See id.*, ¶ 40. Thus, it is a starting time coordinate. The "start slot index (Start Slot)" is a different parameter that indicates the slot index in which the MLC

> should start. *See id.* Thus, it is a separate starting frequency coordinate. Vijayan475 also teaches two other parameters, Max Slot and Min Slot, that together determine the shape of the zigzag. *See id*.

Ex. 2001 [Alberth Decl.] ¶ 61. Thus, the basic definition of the zigzag pattern in Vijayan475 requires ***both*** a starting time coordinate, whether it be called the symbol period index or the Start Offset, ***and*** a starting frequency coordinate, whether it be called the start slot index or the Start Slot. *See id*. This use of separate starting coordinates in the time dimension and in the frequency dimension stands in clear contrast to the claimed "starting time-frequency coordinate." *See id.*

Vijayan475 uses several methods of describing the starting time coordinate and starting frequency coordinate for this zigzag pattern but these methods all use at least two parameters to specify where the pattern should start – one in the time domain and the other in the frequency domain. Vijayan475 first explains that, "the location record carries a Start Offset field, a Slot Info field, and a Stream Lengths field." Ex. 1006 [Vijayan475] ¶ 45. This is the situation the Petition refers to in insisting that, "Vijayan475's 'Start Offset' and 'Slot Info' parameters collectively identify a starting time-frequency coordinate." Pet., 76.

The Start Offset is a starting time coordinate. *See* Ex. 2001 [Alberth Decl.] ¶ 61. Vijayan475 states that "The Start Offset field indicates the first or starting

Ford Motor Co.
Exhibit 1018
Page 030

symbol period index for the slots assigned to the MLC." Ex. 1006 [Vijayan475] ¶ 45; *see also id.*, Table 1 (the entry next to "Start Offset" states "Indicate the starting symbol period index for the slots assigned to the MLC."). This is the same "Start Offset" mentioned when Vijayan475 first described the zigzag pattern and thus is the starting time coordinate. *See* Ex. 2001 [Alberth Decl.] ¶ 62 ("Vijayan475's 'Start Offset' is consistently used to describe the start of the MLC in the time dimension, making it the starting time coordinate.").

The second parameter, the "Slot Info," indicates where in the frequency domain the MLC should start, and is thus a separate starting frequency coordinate. *See* Ex. 2001 [Alberth Decl.] ¶ 62. Vijayan475 states, "The Slot Info field contains slot information, which conveys ***all*** parameters used to describe the assigned slots (e.g., the Min Slot, ***Start Slot***, and Max Slot)." Ex. 1006 [Vijayan475] ¶ 45; *see also* Table 1 (stating next to "Slot Info" that it "Contain[s] parameters describing the slot assigned to the MLC."). Mr. Alberth explains:

> As discussed above, Vijayan475 teaches that Start Slot defines starting slot in the frequency domain and thus is a starting frequency coordinate. Since the Slot Info includes the Start Slot, which is a starting frequency coordinate, among its parameters a POSITA would know that Slot Info is also a starting frequency coordinate. The fact that Slot Info also contains additional information (Min Slot and Max Slot) describing the shape of the zigzag does not negate the fact that it

Ford Motor Co.
Exhibit 1018
Page 031

> is a starting frequency coordinate. This starting frequency coordinate is separate and different from the starting time coordinate, which is the Start Offset. To be clear, the start offset is not part of the Slot Info.

2001 [Alberth Decl.] ¶ 62. In sum, Vijayan475 uses the Start Offset parameter to convey where the MLC should start in the time domain and the separate Slot Info parameter to convey where the MLC should begin in the frequency domain. *See id*. The Slot Info also contains other information on how the zigzag pattern should be shaped, but this does not make it less a starting frequency coordinate. *See id.* It is therefore not materially different from 802.16 in the '450's background, the 802.16-Kim combination rejected in the -01486 IPR, and Vijayan089 above. All of these systems use one parameter for a starting time coordinate and a different parameter for a starting frequency coordinate. They do not disclose or render obvious the claimed single "starting time-frequency coordinate."

Vijayan475 then introduces the idea of using encoding to "reduce the number of bits needed to convey this information." Ex. 1006 [Vijayan475] ¶ 46. It uses a table of "Slot Info Codes" to specify 84 possible starting locations and shapes rather than transmitting the three Slot Info parameters (Min Slot, Start Slot, and Max Slot) that would otherwise be necessary to specify those starting locations and shapes. *See* 2001 [Alberth Decl.] ¶¶ 63-65. This reduces the number of bits

Ford Motor Co.
Exhibit 1018
Page 032

that needs to be transmitted to convey the zigzag shape from nine to seven. *See* Ex. 1006 [Vijayan475] ¶ 49. But this is still more than the three bits that would have been needed to convey the starting frequency coordinate using 802.16. *See* 2001 [Alberth Decl.] ¶ 63 ("Vijayan475's Figure 4 shows frame 216 having eight slots in the frequency domain, which would need three bits to describe using the prior art 802.16 standard described in the '450 patent.").

This encoding does not convert Vijayan475's starting time coordinate and separate string frequency coordinate into the claimed "starting time-frequency coordinate." It continues to use Start Offset as starting time coordinate. *See* Ex. 1006 [Vijayan475] ¶¶ 45, 56, 58, Table 1, FIG. 5; *see also* 2001 [Alberth Decl.] ¶ 64. In the frequency dimension, as Mr. Alberth explains, it does not use the Start Slot and Max Slot parameters within Slot Info, but rather different parameters that can be used, with Min Slot to calculate the Start Slot and Max Slot. *See* Ex. 2001 [Alberth Decl.] ¶ 64.

> As discussed above, Vijayan475 describes the starting location and the shape of its zigzag pattern in Figure 4 using four parameters: the Start Slot, Start Offset, Max Slot, and Min Slot where Start Offset is the starting time coordinate and Start Slot is the starting frequency coordinate. *See* Ex. 1006 [Vijayan475] ¶¶ 40, 45. However, Vijayan475 also proposes using encoding to reduce the number of bits used to convey this information. *Id.*, ¶ 46. Vijayan475 never

Ford Motor Co.
Exhibit 1018
Page 033

> describes changing anything about the Start Offset, which it continues to use as the starting time coordinate. *See id.*, ¶¶ 46-54, 56, 58. It also continues to use the Min Slot. *Id.*, ¶ 48. But instead of directly using the Start Offset, Max Slot it introduces two parameters (Δstart and Δmax) that, along with Min Slot, can be used to calculate the Start Offset and Max Slot. *Id.*, ¶ 47. It gives the following formulas for calculating Δstart and Δmax:
>
> $$\Delta\text{start} = \text{Start Slot} - \text{Min Slot} \qquad \text{Eq (2)}$$
>
> $$\Delta\text{max} = \text{Max Slot} - \text{Start Slot} \qquad \text{Eq (3)}$$
>
> *Id.*, ¶ 47. Of course, these same formulas can be used to derive the Start Slot and Max Slot from Δstart and Δmax. Rearranging EQ(2), it is simple to show that:
>
> $$\text{Start Slot} = \Delta\text{start} + \text{Min Slot}$$
>
> $$\text{Max Slot} = \text{Start Slot} + \Delta\text{max}$$

Ex. 2001 [Alberth Decl.], ¶ 64. Thus, while here Vijayan475 no longer explicitly includes the Start Slot (the starting frequency coordinate) as a parameter it can easily be determined by Min Slot and Δstart. *See id*.

These new parameters are not the only new complication in Vijayan475's second embodiment or even the way this embodiment reduces overhead. As Mr. Alberth explains, this reduction is done through an encoding table.

> Simply transmitting Δstart and Δmax instead of Start Slot and Max Slot there would not necessarily result in any savings in overhead.

> The proposed reduction in overhead comes because Δstart and Δmax, along with Min Slot are tabulated alongside "Slot Info Code" in a table. *See* Ex. 1006 [Vijayan475] Table 2. Instead of directly sending Min Slot, Δstart, and Δmax Vijayan475's second embodiment sends one of the Slot Info Codes – each of which provides a unique combination of Min Slot, Δstart, and Δmax. *Id.*, ¶ 49, Table 2. The Slot Info code requires only 7 bits whereas separately sending Min Slot, Start Slot, and Max Slot would require 9 bits. *Id.* As discussed earlier, this is still more than the 3 bits necessary to convey the starting frequency coordinate if the 802.16 scheme described in the '450 background were used to describe the eight available slot indices. Regardless, the Slot Info Code, by encoding values for Min Slot and Δstart, still conveys Start Slot. The Slot Info Code thus provides the starting location for the MLC in the frequency dimension and is itself a starting frequency coordinate.

2001 [Alberth Decl.] ¶ 65. The Slot Info Code does not directly indicate the Start Slot, but it does allow Vijayan475's wireless device to determine the starting location of the MLC is the frequency dimension. *See id.* Thus it "is itself a starting frequency coordinate." *Id.* Thus Vijayan475 never uses the claimed "starting time-frequency coordinate" with only one dimension but rather consistently uses ***both*** a starting time coordinate ***and*** a starting frequency coordinate.

Ford Motor Co.
Exhibit 1018
Page 035

The Petition makes much of the fact that Vijayan475 seeks to reduce overhead, much like the ’450 patent. Pet., 28 (“Like the ’450 patent, Vijayan475 also endeavors to reduce the amount of overhead signaling needed to convey a resource allocation to a wireless device via the use of an encoding scheme.”), 72 (“Vijayan475’s encoded parameters provide the same overhead reduction benefits described in the ’450 patent.”), 77 (“Vijayan475 also discloses a second way to convey this information to reduce overhead signaling.”). But this does not help Petitioner. Leaving aside that Vijayan475 actually requires ***more*** overhead to describe its zigzag pattern than even the prior art described in the ’450 patent, *see* 2001 [Alberth Decl.] ¶ 63, it seeks to reduce overhead in a completely different way than the ’450 patent. The fact that the ’450 patent and Vijayan475 share a common goal does not mean that they disclose the same means of reaching that goal. *See, e.g., Abbott Labs. v. Sandoz, Inc.*, 544 F.3d 1341, 1352 (Fed. Cir. 2008) (mere “knowledge of the goal does not render its achievement obvious”). Nothing in Vijayan475 discloses or renders obvious the ’450 patent’s claimed features.

Vijayan475 consistently uses ***both*** a starting time coordinate called the Start Offset ***and*** a separate distinct starting frequency coordinate, which may be labeled the Start Slot, the Slot Info, or the Slot Info Code. Thus, it does not teach or render obvious using a single “starting time-frequency coordinate.” For at least this reason, Grounds 2 and 4, relying on Vijayan475 cannot be the basis for institution.

Ford Motor Co.
Exhibit 1018
Page 036

IV. PETITIONER'S REFERENCES DO NOT TEACH OR RENDER OBVIOUS "N TIME-FREQUENCY RESOURCE UNITS … CONTAINING A SET OF FREQUENCY SUBCARRIERS IN A GROUP OF OFDM SYMBOLS" (ALL GROUNDS, ALL CLAIMS).

The '450 patent's challenged claims recite "N time-frequency resource units within a time interval, each unit containing a set of frequency subcarriers in a group of OFDM symbols." Ex. 1001 ['450 Patent] cls. 1, 7, 13. The '450 teaches that grouping multiple OFDM symbols into each time-frequency resource provides a significant reduction in overhead. *See* Section IV.A *infra*. For Vijayan089, the Petition attempts to obscure the fact that its alleged "time-frequency resource unit" has only one OFDM symbol by ignoring the reference's explicit discussion of OFDM symbols and conflating the claimed "OFDM symbols" with modulation symbols. *See* Section IV.B *infra*. The Petition's argument for Vijayan475 is even weaker: as it does not even attempt to show that the alleged "time-frequency resource unit" is in multiple OFDM symbols. *See* Section IV.C *infra*. In fact, the alleged "time-frequency resource unit" in both references covers only a ***single*** OFDM symbol. Since none of the references in the Petition, alone or in combination, are shown to disclose or even suggest a "time-frequency resource unit … containing a set of frequency subcarriers in ***a group*** of OFDM symbols," institution should be denied.

Ford Motor Co.
Exhibit 1018
Page 037

A. The "Time-Frequency Resource Unit" Spans "A Group Of OFDM Symbols," Which Allows For A Reduction In Control Overhead.

One key feature of the claimed invention is that the inventors divided the available resources into "time-frequency resource units." *See e.g.*, Ex. 1001 ['450 Patent] 6:3-6, 6:10-11, 6:22-23, 6:49-50, 7:12-30. Mr. Alberth summarized this as follows:

> The "time-frequency resource unit," recited in the claims was significant and innovative as it allowed for reduction of the overhead required to transmit and recover data in a multi-carrier packet communication system because, using this basic resource unit, the resource space can be defined with two parameters instead of four. … These resource units used a single dimension to provide the control overhead reduction.

Ex. 2001 [Alberth Decl.] ¶ 38.

One of the key features of the time-frequency resource unit is that it has multiple symbols. The '450 patent teaches that, "The resource utilized by this highest MCS is called a basic resource unit ("Unit"), i.e., 80 raw symbols in this example." Ex. 1001 ['450 Patent] 6:49-50; *see also* Table 1.

Ford Motor Co.
Exhibit 1018
Page 038

MCSI	Modulation	Coding rate	Information bits	Raw symbols	Units
1	16QAM	½	160	80	1
2	QPSK	½	160	160	2
3	QPSK	¼	160	320	4
4	QPSK	⅛	160	640	8

Id., Table 1. As Mr. Alberth explains, "In the example in the '450 patent, the basic resource unit has 80 raw symbols in a certain number of subcarriers, which as discussed below, is selected specifically for VOIP applications." Ex. 2001 [Alberth Decl.] ¶ 30. As with many of the features described in the '450 patent, the choice to use multiple OFDM symbols within a time-frequency resource unit reduced the amount of control overhead but at the cost of flexibility. *See id.*, ¶ 68. Mr. Alberth explains this in detail:

> Requiring that the basic resource unit (the claimed "time-frequency resource unit") contain multiple OFDM symbols provides further savings in overhead. This is because when each unit is multiple symbols long, a given zone is divided up into fewer units, which means VZI (the "starting time-frequency coordinate" of the claims) can be sent with less bits. The '450 specification gives an example where a zone is divided into 512 units (the "time-frequency resource units" of the claims). Ex. 1001 ['450 Patent] 7:30-33. This requires a maximum of 9 bits to address each possible starting location since 2^9=512. *Id.*, 7:34-39. Thus, the "starting time-frequency coordinate"

Ford Motor Co.
Exhibit 1018
Page 039

> is only nine bits long. Recall that each of these units is composed of 80 raw symbols and thus, the zone has up to 40,960 addressable locations. If the units were only one OFDM symbol long (such as in the Vijayan089 and Vijayan475 references) the VZI would need to address each of these potential 40,960 locations. This would require up to 16 bits. This savings in overhead comes at the cost of flexibility. Sending a packet stream (the claimed "segment") that is not a multiple of the unit size (80 in the specification's example) would result in wasted bandwidth between the end of that packet stream and the start of the next packet stream. In this example, the inventors were willing to accept this tradeoff of reduced flexibility in exchange for lower overhead because they designed this zone for voice packet streams that all require at least 80 raw symbols. *See id.*, 6:32-64.

Ex. 2001 [Alberth Decl.] ¶ 68. The claims of the '450 capture this choice of using units that are more than one OFDM symbol long as part of the disclosed and claimed invention, by reciting "each unit containing a set of frequency subcarriers in a group of OFDM symbols." Ex. 1001 ['450 Patent] cls. 1, 7, 13 ("time-frequency resource units … each unit containing a set of frequency subcarriers in a group of OFDM symbols.").

Ford Motor Co.
Exhibit 1018
Page 040

B. Vijayan089 Does Not Teach Or Render Obvious "Time-Frequency Resource Units … Each Unit … In A Group Of OFDM Symbols."

For Grounds 1 and 3, in arguing that this limitation is met, Petitioner changes its read of the "OFDM symbol" midcourse, from its original mapping to Vijayan089's "symbol period," to Vijayan089's "modulation symbol" instead. It does this apparently in a vain attempt to sidestep the fact that its alleged "time-frequency resource unit" covers only one "OFDM symbol," rather than the "group of OFDMsymbols" required by the claims.

The Petition, when asserting that Vijayan089 has "time intervals … comprising a plurality of orthogonal frequency division multiplexing (OFDM) symbols," correctly identifies the "OFDM symbols" as Vijayan089's "symbol periods." Pet., 37 ("Any grouping of symbol periods in Figure 4 discloses a 'time interval' as recited in the claims. … A time interval would have encompassed any number of OFDM symbol periods as described in Vijayan089."). This read correctly interprets the claimed "OFDM symbol" as a unit of time.

The alleged "time-frequency resource units" in Petition's read of Vijayan089's are its "transmission slots." Pet., 42 ("Vijayan089 describes transmitting data over 'transmission units' or 'transmission slots' which disclose the claimed 'time frequency resource.'"). When attempting to establish that "each unit containing a set of frequency subcarriers in a group of OFDM symbols,"

however, Petitioner changes its tune. Petitioner no longer discusses symbol periods as the alleged "OFDM symbols" like it had earlier in the Petition, but rather, switches to arguments based on modulation symbols. *Compare id.*, 42 *with id.*, 48 (never using "symbol period" but twice mentioning "modulation symbols"). The reason for this switch is quite simple: each of Vijayan089's transmission slots covers only one symbol period, and thus the transmission slot is not "in a group of OFDM symbols" as required by the claims.

Vijayan089 OFDM symbol period and modulation period are very different concepts, that are not interchangeable. In describing the structure of the time-frequency plane in Figure 4, Vijayan089 defines the symbol period as follows:

> FIG. 4 shows the structure of one frame on a time-frequency plane. The horizontal axis represents time, and the vertical axis represents frequency. Each frame has a predetermined ***time duration, which is given in units of OFDM symbol periods*** (or simply, symbol periods). ***Each OFDM symbol period is the time duration to transmit one OFDM symbol*** (described below).

Ex. 1005 [Vijayan089] ¶ 46. Thus, as Mr. Alberth explains, "Vijayan089's symbol period is simply a measure of time, as indicated by the fact that it is described as the unit in time axis." Ex. 2001 [Alberth Decl.] ¶ 69. This is clearly seen in the label of Figure 4's horizonal axis:

Ford Motor Co.
Exhibit 1018
Page 042

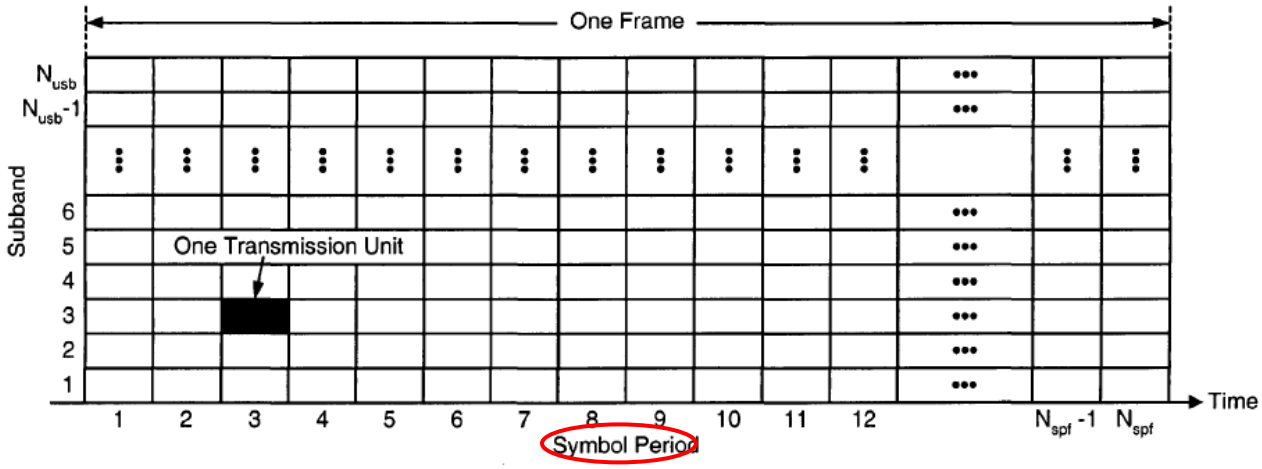


FIG. 4

Ex. 1005 [Vijayan089] Fig. 4. By contrast, the "modulation symbol" is a unit or resource for transmitting different types of signals. *See* Ex. 2001 [Alberth Decl.] ¶ 70. As Mr. Alberth explains:

> Vijayan089 states: "With OFDM, one modulation symbol may be sent on each subband in each symbol period, i.e., each transmission unit." Ex. 1005 [Vijayan089] ¶ 47. These modulation symbols can be used to transmit data, a pilot signal or no signal at all if the modulation symbol is used as a guard. *See id.* ("As used herein, a 'data symbol' is a modulation symbol for data, a 'pilot symbol' is a modulation symbol for pilot, and a 'guard symbol' is a signal value of zero."). There can be multiple modulation symbols in a single symbol period. *See id.*; *see also id.*, ¶ 59 ("A slot corresponds to one group of (e.g., 500) data subbands or, equivalently, one group of modulation symbols in one symbol period.").

Ex. 2001 [Alberth Decl.] ¶ 70. Multiple modulation symbols can be found within one symbol period. *See id*.

As explained above, the Petition attempts to identify Vijayan089's two different objects – symbol periods and modulation symbols – as the '450 patent's claimed "orthogonal frequency division multiplexing (OFDM) symbols." But neither is the claimed "OFDM symbol." Rather the claimed "OFDM symbol" can be directly mapped to Vijayan089's own OFDM symbols, which are described in at least 16 locations, none of which are mentioned in the Petition's discussion of this limitation. *See e.g.*, Ex. 1005 [Vijayan089] ¶¶ 44, 46, 65, 69, 106. It is these OFDM symbols from Vijayan089 that map onto the OFDM symbols of the claims.

Vijayan089's OFDM symbols are very much related to the symbol period discussed above. Indeed, Vijayan089 defines the symbol period using the OFDM symbol. *Id.*, ¶ 46. ("Each OFDM symbol period is the time duration to transmit one OFDM symbol."). Thus Petitioner was correct when it stated that, "a length of time encompassing two symbol periods (i.e., a time interval as depicted in Figure 4) would encompass two OFDM symbols." Pet, 37-38. So it is undisputed, given this statement in the Petition, that the number of claimed "OFDM symbols" can be tabulated by counting the number of symbol periods covered on the horizontal axis of a time-frequency plane. *See* Ex. 2001 [Alberth Decl.] ¶ 69 ("The number of the

Ford Motor Co.
Exhibit 1018
Page 044

claimed ‘OFDM symbols’ contained in a unit, such as shown in Figures 4 or 7B, can be measured using the ‘Symbol Period’ on the horizontal axis.”).

Using the correct read of the “OFDM symbol” onto Vijayan089, its transmission slots do not satisfy the limitation of “containing a set of frequency subcarriers ***in a group of OFDM symbols***.” The same approach that the Petition used to measure the number of “OFDM symbols” in the alleged “time interval” can also be used to determine the number of “OFDM symbols” in each of the alleged “time-frequency resource units.” This is most clearly evident from examining Figure 7B of Vijayan089 as annotated by Petitioner:

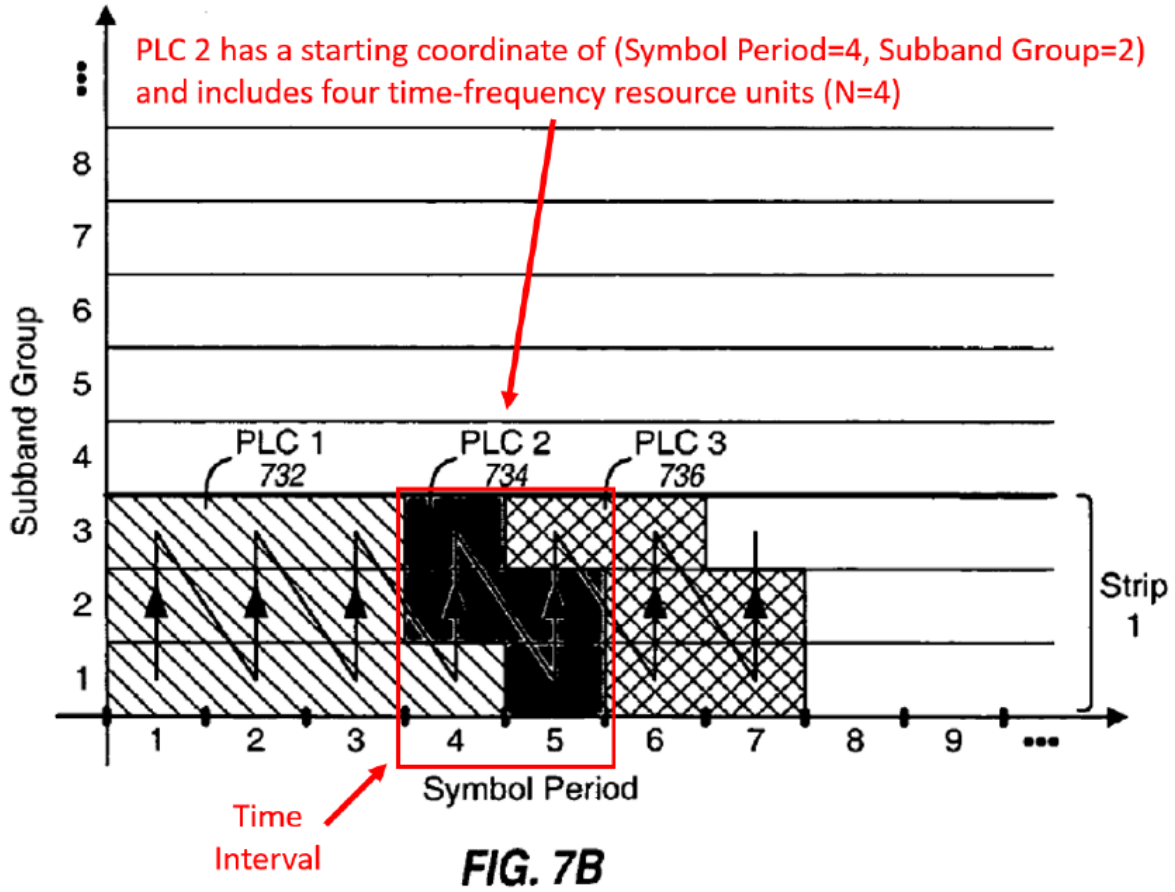


FIG. 7B

Pet., 46 (Ex. 1005 [Vijayan089] Fig. 7B with Petitioner's annotations). Mr. Alberth explains how this figure and its annotations show "time-frequency resource units" containing a set of frequency subcarriers in a ***single*** "OFDM symbol" rather than the "***group*** of OFDM symbols" required by the claims:

> Figure 7B of Dr. Wilson's annotation to this figure correctly states that "PLC 2 … includes four time-frequency resource units (N=4). Ex. 1003 [Wilson Decl.] ¶¶ 144; *see also* Pet., 46 (Ex. 1005 [Vijayan089] Fig. 7B with Petitioner's annotations). The "time-frequency resource units" clearly refers to the four blackened boxes resembling a tetris symbol S rotated clockwise onto its side labeled

> 734. Each of the four black boxes is a transmission slot. Ex. 1005 [Vijayan089] ¶ 59 ("The allocated resources for each active PLC may be given in units of 'transmission slots' (or simply, 'slots')."). From this figure it can easily be seen that each slot has a duration of only one symbol period. *See* Ex. 1005 [Vijayan089] Fig. 7B. Since the slot is the alleged "time-frequency transmission unit," and each symbol period is the duration of a single claimed "OFDM symbol," this shows that the "time-frequency transmission unit" does not contain subcarriers in "a group of OFDM symbols" as required by the claim. Rather, the slot only lasts one symbol period so the alleged "time-frequency transmission unit" at most contains a set of frequency subcarriers in a single OFDM symbol.

Ex. 2001 [Alberth Decl.] ¶ 71. Using the same method that the Petition applied to measure an alleged "time interval" in Figure 4, it is clear from Figure 7B that each alleged "time-frequency resource unit" (the transmission slot) is only in a single OFDM symbol. *See id.* The Vijayan089 specification provides further evidence of this. It states, "***A slot*** corresponds to one group of (e.g., 500) data subbands or, equivalently, one group of modulation symbols ***in one symbol period***." Ex. 1005 [Vijayan089] ¶ 59. Since one symbol period is defined as the duration of one OFDM symbol, this statement indicates that a slot is only "in" one OFDM symbol. *See* Ex. 2001 [Alberth Decl.] ¶ 71 ("A POSITA would understand Vijayan089's statement that a slot is 'in one symbol period' to teach that each slot only contains

Ford Motor Co.
Exhibit 1018
Page 047

one OFDM symbol.”). It is therefore clear that Vijayan089 neither discloses or renders obvious “time-frequency resource units … each unit containing a set of frequency subcarriers in a group of OFDM symbols” and Ground 1 and 3, relying on Vijayan089 cannot be the basis for institution.

Even if, contrary to the evidence presented above, the modulation symbol could be considered the claimed “OFDM symbol” and the “group of OFDM symbols” limitation could be met, this read is inconsistent with Petitioner’s earlier position that the claimed “OFDM symbol” should be read on Vijayan089’s symbol period. Petitioner did not even attempt to show that the modulation symbol could satisfy the limitation that “each time interval compris[es] a plurality of orthogonal frequency division multiplexing (OFDM) symbols.” Pet., 37. Petitioner only switched to the modulation symbol read for the “group of OFDM symbols” limitation. *Id.*, 48. Petitioner’s attempt to “switch horses mid-race” should be rejected because the Petition has failed to provide a consistent account of its combination. That failing alone is a more than sufficient reason to reject this ground, for it is well-settled that inconsistent unpatentability theories in IPR petitions cannot support institution under Section 314(a). *See, e.g., Facebook, Inc. v. Uniloc USA, Inc.*, IPR2017-01524, Paper 7, 19 (Dec. 4, 2017) (“It is not our role to pick a theory for Petitioner … between the conflicting options presented, without explanation, in the Petition and Dr. Lavian’s Declaration, and then to apply

that selected theory consistently ... where Petitioner has failed to do so.") (denying institution); *Coherus Biosciences, Inc. v. Hoffman-La Roche Inc.*, IPR2017-02066, Paper 11, 14 (Mar. 9, 2018) ("Petitioner cannot have it both ways, particularly without an explanation why."); *Denso Corp. v. Collision Avoidance Techs. Inc.*, IPR2017-01715, Paper 7, 55-57 (Jan. 23, 2018) ("Petitioner's inconsistent arguments ... do not meet the requirement of our rules.").

For this additional reason, Vijayan089 does not disclose or render obvious all the "OFDM symbol" claim limitations. Thus, Grounds 1 and 3, relying on Vijayan089, cannot be the basis for institution.

C. Vijayan475 Does Not Teach Or Render Obvious "Time-Frequency Resource Units … Each Unit … In A Group Of OFDM Symbols."

For Grounds 2 and 4 the Petition relies exclusively on Vijayan475 to establish the claimed "OFDM symbols." Pet., 69, 80. As in Vijayan089, Vijayan475's "slot" is allegedly the claimed "time-frequency resource unit." *Id.*, 80. Vijayan475 fails to disclose or render obvious that its slot contains "a group of OFDM symbols." As with the Vijayan089, the Petition initially identified Vijayan475's "symbol period" as the alleged "OFDM symbol." *Id.*, 69 ("Each slot within the time interval has a ***duration of one OFDM 'symbol period'*** as seen in Figure 4."). However, in the section attempting to show that the alleged "each unit containing a set of frequency subcarriers in a group of OFDM symbols" the

Petition makes no attempt to show that the slot spans multiple of the symbol periods. *Id.*, 80. The Petition's analysis of this limitation is sufficiently brief that it is possible to review each and every time it mentions the "OFDM symbols" from the claim language.

"OFDM symbols" are mentioned twice as Petitioner attempts to show that "slots ***convey*** OFDM symbols" and that "Vijayan475 ***conveys*** data using OFDM symbols." Pet., 80. These assertions, however, do nothing to prove that the slot has "a set of frequency subcarriers in a group of OFDM symbols" as recited in the claims. The Petition fails to explain how the fact that the multiple slots of the MLC convey OFDM symbols has any bearing on whether each individual slot "contain[s] a set of frequency subcarriers in a group of OFDM symbols" as claimed. Multiple slots in a MLC segment could, after all, convey multiple OFDM symbols even if each individual slot is not "in a group of OFDM symbols." It is similarly neither here nor there whether "Vijayan475 conveys data using OFDM symbols." It may be technically so that Vijayan475's MLCs transmit data, Ex. 1006 [Vijayan475] ¶ 33, and the MLC is sent over a frame that is divided into symbol periods. *Id.*, ¶ 39. This is, however, irrelevant to whether the slots cover a "group of OFDM symbols." These two mentions of "OFDM symbols" prove nothing useful to Petitioner as to the "group of OFDM symbols."

Ford Motor Co.
Exhibit 1018
Page 050

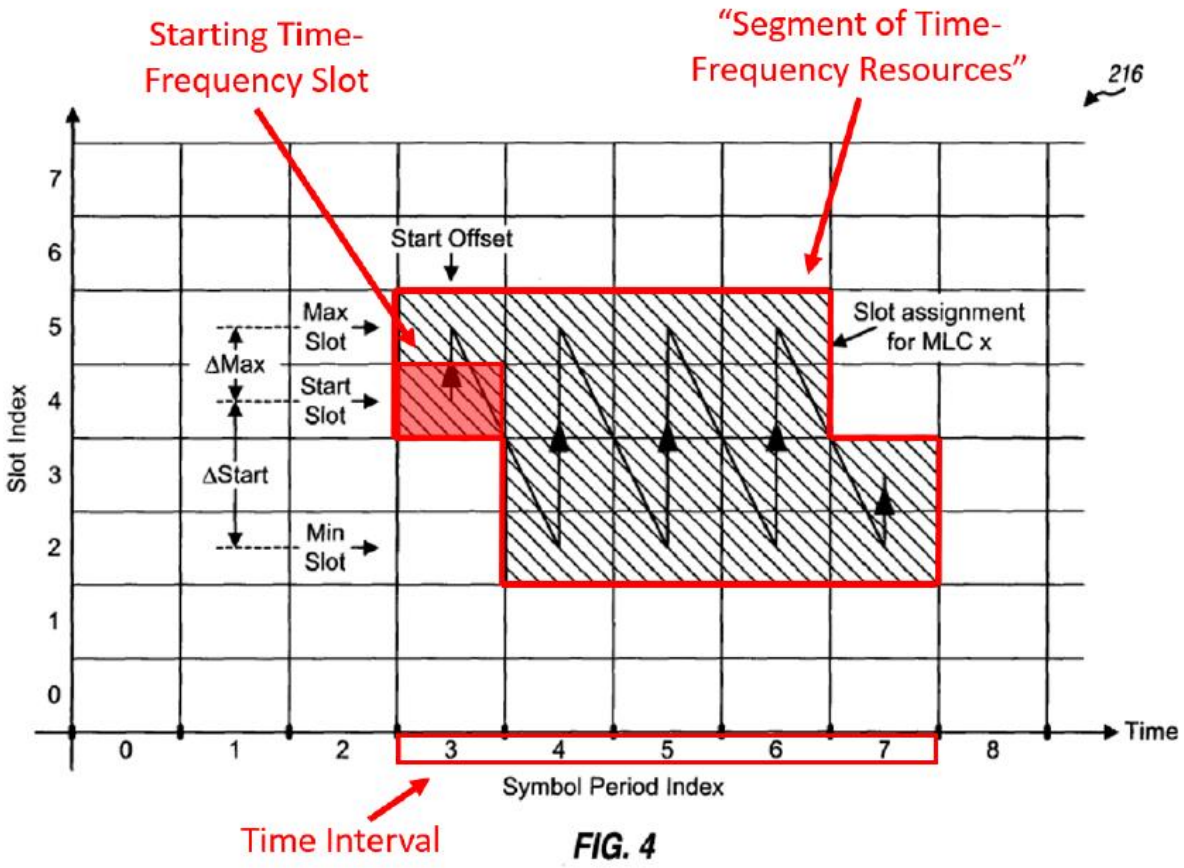
The Petition also uses "OFDM symbol" in two other sentences, but only to show that Vijayan475 has multiple subcarriers in each slot. First, the Petition states:

> Each slot includes a set of frequency subcarriers: "M slots are formed in each symbol period and are mapped to M disjoint or non-overlapping sets of subbands, where M ≥1." EX1006, ¶36.

Pet., 80. Then it states, "When transmitting OFDM symbols, multiple carriers or 'multiple [] orthogonal subbands' are used." *Id.* Neither of these statements are relevant to whether the slot covers "a group" of symbol periods as the Petition's mapping of the claims require. The Petition ends this argument with the conclusory statement, "Thus, Vijayan475 discloses each slot including a set of frequency subcarriers in a group of OFDM symbols." *Id.* But this conclusion is contradicted by the Petition's earlier statement that, "***Each slot*** within the time interval has a ***duration of one OFDM 'symbol period'*** as seen in Figure 4." Pet., 69. As shown below, this earlier admission that the "group of OFDM symbols" is not met by Vijayan475 is the inevitable conclusion drawn from examining Vijayan475.

Vijayan475 is clear that, in the embodiment relied upon by the Petition, while each slot can cover multiple subcarriers, it is limited to one "symbol period." As quoted in the Petition, Vijayan475 states: "M ***slots are formed in each symbol***

period and are mapped to M disjoint or non-overlapping sets of subbands, where M ≥1." Ex. 1006 [Vijayan475] ¶ 36; Pet., 73. Therefore, each slot in this embodiment is formed in a single symbol period. Moreover, Figure 4 of Vijayan475 illustrates that slots only last one symbol period.



Pet., 76 (annotating Figure 4 of Ex. 1006 [Vijayan475]. In the above reproduction of Figure 4, the Petitioner annotates and colors in red one of Vijayan475's slots. Each of the other 15 rectangles are also slots. Lining up these slots with the horizontal axis labeled "Symbol Period Index," it is clear that every single one of

these slots occupies ***only one*** symbol period. Ex. 2001 [Alberth Decl.] ¶ 72 ("Figure 4 of Vijayan475 clearly shows that each of the slots covers only one symbol period."). Thus it is clear that the embodiment relied upon by Petitioner in Vijayan475 does not teach or render obvious a "time-frequency resource units … each unit … in ***a group*** of OFDM symbols" as required by the claims.

For these further reasons, Grounds 2 and 4, relying on this embodiment cannot be the basis for institution.

V. THE FAILURE OF THE PRIOR OBVIOUSNESS CHALLENGE WEIGHS AGAINST GRANTING THIS FOLLOW-ON CHALLENGE.

As discussed above, this is not the first IPR that challenges these claims. The failure of the earlier challenge weighs against finding obviousness in this case. This is true regardless whether the rejection of the prior challenge is considered as the first of improper serial petitions (Sections V.A-B, *infra*), or as an objective indicator of nonobviousness (Section V.C, *infra*).

In exercising its discretion under 35 U.S.C. § 314(a), the Board generally analyzes factors like those set forth in *General Plastic Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19, 16–17 (Sep. 6, 2017) (precedential as to § II.B.4.i). The factors recited in *General Plastic* are "non-exhaustive," *id.*, 16, and "are not intended to represent all situations where it may be appropriate to deny a petition." CTPG, 58. Furthermore, no single factor can dispositively

require institution. "[N]ot all the factors need to weigh against institution for [the Board] to exercise [its] discretion under § 314(a)." *Abiomed, Inc. v. Maquet Cardiovascular, LLC*, IPR2017-02150, Paper 11, 7 (Mar. 12, 2018). In the instant matter, as explained in the following sections, numerous of the *General Plastic* factors, including those relating to fairness concerns of using a prior non-institution as a roadmap, as well as the finite resources of the Board and obviousness law itself, counsel against institution.

A. This Petition Used The Denial Of The Prior IPR As A Roadmap.

As already discussed above, in IPR2021-01486, Dell filed a petition for *inter partes* review of claims 1–18 of the '450 patent based on obviousness. A Board panel denied review on the merits, finding not even a threshold likelihood of obviousness for any claim. -1486 DDI.

Over six months later, Petitioner filed its petition, also alleging obviousness, based on different references. Pet., 97. Petitioner discusses why the previous obviousness challenge was denied, and argues that its references and arguments are "different" from those in that case in ways that distinguish it from the basis for denial of the Dell petition. *Id.*, 17 (asserting that decision denying trial in 01486 "indicated that the proposed combination did not teach [the claimed] features" of "time-frequency coordinate" or a "time-frequency resource unit … and that Dell conflated "separate frequency subchannels and time slots as the recited singular

Ford Motor Co.
Exhibit 1018
Page 054

'time-frequency resource' and separate starting time and frequency coordinates as the recited singular 'starting time-frequency coordinate"), 97-98 (arguing that the art relied upon for the grounds in this petition, "Vijayan089, Vijayan475, Laroia, Wu, and Choi[,] substantively differ from the IPR2021-01486 art" in ways going to the reasons trial in 01486 was denied). Thus, Petitioner, based on "review and consideration of the record in IPR2021-01486" (*id.*, 98), replaced the Kim and IEEE802.16-2004 references in that case with "different" references, in an attempt to address the flaws the panel pointed out and relied upon to reject the 01486.

The Office has long disfavored such "road-mapping." *See, e.g., Synaptics, Inc. v. Amkor Tech, Inc.*, IPR2017-00085, Paper 12, 10 (Apr. 18, 2017) ("We disfavor allowing follow-on petitions that attempt to fix deficiencies in a previous petition that were explained in a previous decision on institution."). And this is disfavored for good reason. "As *General Plastic* noted with regard to 'road-mapping':

> Multiple, staggered petitions challenging the same patent and same claims raise the potential for abuse. The absence of any restrictions on follow-on petitions would allow petitioners the opportunity to strategically stage their prior art and arguments in multiple petitions, using our decisions as a roadmap, until a ground is found that results in the grant of review.

Ford Motor Co.
Exhibit 1018
Page 055

Code200, UAB v. Bright Data Ltd., IPR2022-00861, Paper 18, 5 (Aug. 23, 2022) (precedential) (quoting *Gen. Plastic* (precedential), 17). This precedent further holds that "the filing of sequential attacks against the same claims, with the opportunity to morph positions along the way, imposes inequities on Patent Owner," particularly when they are "based on the analysis articulated in [the] Decisions Denying Institution of" earlier challenges. *Gen. Plastic* (precedential), 11 (internal quotation and alteration marks omitted); *see also id.*, 17 (explaining the "benefit from receiving and having the opportunity to study Patent Owner's Preliminary Response, as well as our institution decisions on the first-filed petitions, prior to [the] filing of follow-on petitions," can create "undue inequities and prejudices to Patent Owner"). Such "road-mapping concerns" are particularly significant when the prior denial was on the merits rather than discretionary and when the "later petition" is "refined based on lessons learned" from the previous denial to be different from the art "in the previously-filed petition." *Code200* (precedential), 5.

While these decisions have concentrated upon the discretion to deny serial petitions by a single petitioner, these concerns also apply when the petitioners are not the same. The Board's precedent further holds that "[i]n general, having multiple petitions challenging the same patent, especially when not filed at or around the same time as in this case, is inefficient and tends to waste resources,"

Ford Motor Co.
Exhibit 1018
Page 056

and that "application of the *General Plastic* factors is not limited solely to instances when multiple petitioners are filed by the same petitioner." *Valve Corp. v. Electronic Scripting Products, Inc.*, IPR2019-00062, Paper 11, 2, 15 (Apr. 2, 2019) (precedential). It has also been held that a "significant relationship" between different petitioners challenging the same patent under this precedent may be created when the second petitioner picks and chooses from an earlier petitioner's work product—much like the road-mapping from the 01486 IPR on which the obviousness arguments in this case are based. *Ericsson Inc. v. Uniloc 2017, LLC*, IPR2019-01550, Paper 8, 12 (Mar. 17, 2020).[4] *Valve* and its progeny like *Ericsson*

[4] It is also noteworthy that prominent members of the legislative branch of government, including the current chairman of the Senate Intellectual Property Subcommittee, have publicly expressed their concerns to the Office that "'serial and repetitive attacks,' even by different petitioners, weigh against institution. *See, e.g.*, Ex. 2014 [Tillis–Coons Ltr.], 1-2 (stating that "follow-on petitions attacking the same claims and asserting new or modified arguments—either by the same petitioner or different petitioners…impose an undue burden on patent owners and harm innovation," expressing the view that *General Plastic* is too forgiving a standard for discretionary denial, and asking Director whether he will "adopt a presumption that, when the PTAB has already issued a decision on institution with

are, like *General Plastic*, directed specifically to discretionary denial, but these concerns go beyond that narrow context, and extend to the merits of "refin[ing]" follow-on obviousness challenges on the "lessons learned" from the rejections of previous challenges. *Code200* (precedential), 5. Indeed, long before the creation of IPRs, it has been the law that failed validity challenges weigh against subsequent attacks—even when the attacks are brought in different cases, by different, later challengers, and particularly when such challenges allege obviousness as discussed below.

Even aside from the hindsight "road-mapping" on which the Petition is based, it may be pointed out that there are exceptionally clear ways in which the "different" alleged prior art raised in this petition is even less persuasive, for obviousness purposes, than the alleged prior art raised in the grounds already denied trial as meritless at the threshold in the 01486 case. For example, Vijayan089 and Vijayan475 are worse than the obviousness combination in -01486 Petition in that their alleged "time-frequency resource units" do not contain "a group of OFDM symbols." *See* Section IV *supra*. The -1486 Petition failed to

---

respect to a particular patent, further petitions, whether by the original petitioner or different petitioners, will not be entertained in the absence of compelling circumstances").

Ford Motor Co.
Exhibit 1018
Page 058

establish that the Kim (Ex. 1015) and IEEE802.16-2004 (Ex. 1016) references, *i.e.*, the combination in the grounds rejected in the -01486 case, disclosed or rendered obvious the claimed "time-frequency resource unit." -01486-DDI, 26. But even its the alleged "time-frequency unit" (Kim's "minimum possible data allocation unit") was made up of 3 OFDM symbols and thus could have arguably satisfied the "group of OFDM symbols" limitation. -01486 Pet., 52 ("For example, Kim discloses an example of a subchannel containing a set of 16 subcarriers within a group of '3 OFDM symbols.'"). Here, as already explained in Section IV above, the alleged "time-frequency resource unit" mapped in the new combination in this case are not shown to span more than one OFDM symbol.

B. The Denial Of The Prior Challenge Is Entitled To Weight.

A tribunal's prior decision "on the same legal issue," including a prior decision on the ultimate issue of obviousness, is entitled to "deference" in later cases on the same issue. *Mendenhall v. Cedarapids, Inc.*, 5 F.3d 1557, 1569-1570 (Fed Cir. 1993). More specifically, "[a] prior decision that a patent has previously survived an attack on its validity" informs later courts "that caution must be taken in reaching a contrary legal conclusion," even when the references and challengers differ between the earlier and later cases. *Id.; see Radio Corp. of Am. v. Radio Eng'g Labs.*, 293 U.S. 1, 8 (1934) ("a stranger to a patent suit does not avoid altogether the consequences of a judgment rendered in his absence by establishing

Ford Motor Co.
Exhibit 1018
Page 059

his privilege under the doctrine of *res judicata* to try the issues over again"); *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1359 (Fed. Cir. 2001) ("that the patent in suit had successfully withstood previous validity challenges in other proceedings" presents "a clear case supporting the validity of the patent"); *Gillette Co. v. S.C. Johnson & Son, Inc.*, 919 F.2d 720, 723 (Fed. Cir. 1990) ("that the validity of those claims has previously been upheld in an earlier litigation is also to be given weight"); *Custom Accessories, Inc. v. Jeffrey-Allan Indus.*, 807 F.2d 955, 961 (Fed. Cir. 1986) (failed prior challenges are "evidence the court must consider"); *Stevenson v. Sears, Roebuck & Co.*, 713 F.2d 705, 711 (Fed. Cir. 1983) ("prior holding of 'validity' should be given weight in a subsequent suit on the issue of 'validity'"); *Farmhand, Inc. v. Anel Eng'g Indus.*, 693 F.2d 1140, 1143-1144 n.6 (5th Cir. 1982) ("previous determination of validity is one factor which a court or jury may consider in deciding whether a patent is valid"); *B&H Mfg. v. Foster-Forbes Glass Co.*, 26 U.S.P.Q.2d (BNA) 1066, 1070, 1993 U.S. Dist. LEXIS 21432, *15 (N.D. Ind. 1993) (prior judgment rejecting validity challenge "give[n]…weight"); *Multi-Tech Sys., Inc. v. Hayes MicroComputer Prods., Inc.*, 800 F. Supp. 825, 832-833 (D. Minn. 1992) (case for patent's validity strengthened by "the prior adjudication affirming its validity"); *Jenn-Air Corp. v. Modern Maid Co.*, 499 F. Supp. 320, 323 (D. Del. 1980) ("prior

adjudication of validity rendered on relevant grounds" is "independent evidence in support of validity").

The challenger in the second action "has the burden of demonstrating that there is a material distinction between his case and the prior case holding the patent 'valid.'" *Stevenson*, 713 F.2d at 711 n.5. It is significant if the cases are "before entirely different factfinders," or involve different standards of proof, *Mendenhall*, 5 F.3d at 1571, but where both are before the same factfinder under the same standards, the factfinder may treat his findings in the first case as relevant in the second, *see id.*, 1572; *Supernus Pharms., Inc. v. TWi Pharms., Inc.*, 265 F. Supp. 3d 490, 519 n.13 (D.N.J. 2017), *aff'd*, 747 Fed. Appx. 852 (Fed. Cir. 2018).

A denial of institution on the merits is entitled to significant weight in a later IPR against the same patent. Unlike a decision to institute, which is decided on a low threshold and is preliminary, a decision to ***deny*** institution is decided on the opposite threshold (***lack*** of reasonable likelihood), and is final. Nor does the fact that denials are unappealable by statute deprive them of weight. *See* MOORE'S FED. PRAC. § 131.30[2][c][ii] (2000) ("The fact that no appeal of [a judgment in an earlier action] was authorized by the governing law does not change its preclusive effect") (citing "*Johnson Steel St. Rail Co. v. William Wharton Jr. & Co.*, 152 U.S. 252, 256-257 [] (1894) (res judicata does not depend on availability of appeal)").

Ford Motor Co.
Exhibit 1018
Page 061

C. Failure Of The Prior Challenge Is Evidence Of Nonobviousness.

Furthermore, much as prior acquiescence and licensing and prior failed attempts to make the invention are objective indicia of nonobviousness, *see, e.g.*, *PPC Broadband, Inc. v. Corning Optical Commns. RF, LLC*, 815 F.3d 734, 746 (Fed. Cir. 2016), so too are prior failed obviousness challenges. The fact "that the patent in suit had successfully withstood previous validity challenges in other proceedings" presents "a clear case supporting the validity of the patent." *Amazon.com*, 239 F.3d at 1359; *see Beloit Corp. v. Valmet Corp.*, 1997 U.S. Dist. LEXIS 21329, at *11-12 (W.D. Wis. July 15, 1997) (granting summary judgment of nonobviousness, citing "secondary evidence of validity because a jury found [the claims] not invalid in [prior] litigation").

Where obviousness challenges use prior challenges as a roadmap, it is particularly logical that the prior failed challenges become objective indicators of ***non***obviousness. As the Supreme Court has explained, even if a prior unsuccessful validity challenge does not bar a later challenge raising different references, the fact that these references "were not called to the attention of the prior court is likely to open them to suspicion." *Mast, Foos & Co. v. Stover Mfg. Co.*, 177 U.S. 485, 488-489 (1900). That is logical: the reason they were not raised in the first case is likely that, without the benefit of the roadmap from that case, they would

Ford Motor Co.
Exhibit 1018
Page 062

not have been selected. But obviousness must not be based on hindsight. Using the first challenge as the guide to the second is the quintessence of hindsight.

Petitioner contends that its "review and consideration of the record in IPR2021-01486" as its guide to crafting its revised obviousness grounds here does not constitute "us[ing] the Dell IPR as a 'roadmap' to craft invalidity positions." Pet., 98. Logic and Board precedent are to the contrary. Precedent views "road-mapping" as exactly what Petitioner is doing: basing a subsequent challenge on analysis articulated in a decision denying institution of an earlier challenge, with "the opportunity to morph positions along the way." *Gen. Plastic* (precedential), 11, 17; *Code200* (precedential), 5; *see also Amkor*, IPR2017-00085, Paper 12, 10 (describing and disfavoring "follow-on petitions that attempt to fix deficiencies in a previous petition that were explained in a previous decision on institution").

Such hindsight "road-mapping" logically is an indicator of <u>non</u>obviousness, because of how the knowledge of a person of ordinary skill in the art is defined. "The person of ordinary skill in the art [('POSITA')] is a hypothetical person who is presumed to have known the relevant art at the time of the invention." MPEP § 2141(II)(C). But the POSITA is ***not*** presumed to have knowledge of events after the invention was made, such as attempts to invalidate the patent. "It is difficult to imagine a patent law suit in which [a challenger] is unable to add some new 'pertinent' art," but nevertheless, the law of obviousness requires "that the

Ford Motor Co.
Exhibit 1018
Page 063

decisionmaker forget what he or she has been taught about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented ***only*** with the references, and who is normally guided by the then-accepted wisdom in the art." *W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553 (Fed. Cir. 1983) (alteration marks omitted, emphasis added). While the POSITA knows the prior art at the time of the invention, he knows "only" what is ***prior*** art, *id*., and is "guided ***only*** by the ***prior*** art references and the ***then***-accepted wisdom in the field," *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999) (emphases added). It is "hindsight" to analyze obviousness as if the POSITA has knowledge of "'the blueprint drawn by the inventor.'" *Id.*; *accord Sensonics, Inc. v. Aerosonic Corp.*, 81 F.3d 1566, 1570 (Fed. Cir. 1996) ("To draw on hindsight knowledge of the patented invention, when the prior art does not contain or suggest that knowledge, is to use the invention as a template for its own reconstruction"); *Gore*, 721 F.2d at 1553 ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."). But if it is hindsight to imbue the POSITA with knowledge of the blueprint drawn in the ***patent***, it would be hindsight on stilts to imbue the POSITA with knowledge of the

roadmap laid down by ***much later*** failed obviousness challenges to the patent, which can only be based on even greater hindsight. "It is not pertinent that the invention was easily understood ***after*** it was made... but whether it would have been obvious to make the invention ***at the time***." *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1144 (Fed. Cir. 1985) (emphases added). Accordingly, when obviousness challenges are, like this one, based on review and consideration of a prior unsuccessful challenge, it is an indicator of nonobviousness.

At minimum, it should be presumed that, to the extent the follow-on obviousness challenge differs from the prior challenge it used as a guide, those differences are based on hindsight, which objectively weigh against finding obviousness. *See Stevenson*, 713 F.2d at 711 n.5 (second challenger "has burden of demonstrating that there is a material distinction between his case and the prior case holding the patent 'valid.'"). The Petition concedes that it refined its grounds in ways Petitioner hopes directly address the reasons that the 01486 panel gave for denying trial. Section § V.A *supra*. But Petitioner offers no other reasons the POSITA would have instead turned to these different combinations—which, "suspicio[usly]," "were not called to the attention of the prior court," *Mast*, 177 U.S. at 488-489—***except*** these lessons learned from the prior case. Therefore, Petitioner does not overcome the "susp[icion]" that, "[a]bsent any explanation to

Ford Motor Co.
Exhibit 1018
Page 065

the contrary," the reason for the differences is "impermissible hindsight." *Harris Corp. v. Fed. Express Corp.*, 502 Fed. Appx. 957, 967 (Fed. Cir. 2013).

* * *

For these reasons, the rejection of the prior IPR weighs against institution, both as to discretion and on the merits.

VI. CONCLUSION

Any of the bases in Sections III-VI provides an independent reason to deny the Petition, and Patent Owner respectfully requests the same.

Respectfully submitted,

/Kenneth J. Weatherwax/

Kenneth J. Weatherwax, Reg. No. 54,528
LOWENSTEIN & WEATHERWAX LLP
Date: February 8, 2023

Ford Motor Co.
Exhibit 1018
Page 066

CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITS

This Patent Owner Preliminary Response (the "POPR") consists of 12,427 words, excluding table of contents, table of authorities, certificate of service, this certificate, or table of exhibits. The POPR complies with the type-volume limitation of 14,000 words as mandated in 37 C.F.R. § 42.24. In preparing this certificate, counsel has relied on the word count of the word-processing system used to prepare the paper (Microsoft Word).

Respectfully submitted,

/ Robert Pistone /

Date: February 8, 2023

Ford Motor Co.
Exhibit 1018
Page 067

CERTIFICATE OF SERVICE

The undersigned hereby certifies that the following documents were served by electronic service, by agreement between the parties, on the date below:

PATENT OWNER PRELIMINARY RESPONSE

EXHIBITS 2001-2006 and 2014

The names and addresses of the parties being served are as follows:

Ryan C. Richardson	rrichardson-PTAB@sternekessler.com
Timothy L. Tang	ttang-PTAB@sternekessler.com
Christopher R. O'Brien	cobrien-PTAB@sternekessler.com
Michael D. Specht	mspecht- PTAB@sternekessler.com
Daniel E. Yonan	dyonan-PTAB@sternekessler.com
	PTAB@sternekessler.com

Respectfully submitted,

/ Robert Pistone /

Date: February 8, 2023