

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIVINT, INC.,
Petitioner,

v.

FRACTUS S.A.,
Patent Owner,

Patent No. 8,738,103 to Puente Baliarda et al.
Issue Date: May 27, 2014
Title: Multiple-Body-Configuration Multimedia
and Smartphone Multifunction Wireless Devices

Inter Partes Review No.: IPR2024-00087

Petition for *Inter Partes* Review of U.S. Patent No. 8,738,103
Under 35 U.S.C. §§311–319 and 37 C.F.R. §42.100 *et seq.*

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TABLE OF EXHIBITS

Exhibit No.	Exhibit Name
1001	U.S. Patent No. 8,738,103 (“the ’103 Patent”)
1002	Declaration of Dr. Manos Tentzeris
1003	U.S. Patent No. 6,239,765 to Johnson <i>et al.</i> (“Johnson”)
1004	U.S. Patent Application Publication No. 2007/0238483 to Boireau <i>et al.</i> (“Boireau”)
1005	U.S. Patent Application Publication No. 2003/0189522 to Zeilinger (“Zeilinger”)
1006	RESERVED
1007	Excerpts of the prosecution history of the ’103 Patent
1008	Expert Declaration of Stuart A. Long from Fractus, S.A. v. ADT, LLC, 2:22-cv-00412 (E.D. Tex) (Oct. 5, 2023)
1009	Docket Control Order from Fractus, S.A. v. ADT, LLC, 2:22-cv-00412 (E.D. Tex) (Feb. 3, 2023)

I. INTRODUCTION

Pursuant to 35 U.S.C. §§311–19 and 37 C.F.R. §42.100 *et seq.*, Petitioner, Vivint, Inc. (“Petitioner”), requests *Inter Partes* review of Claims 12 and 15 (the “Challenged Claims”) of U.S. Patent No. 8,738,103 (the “’103 Patent,” EX1001). The Challenged Claims should be found unpatentable and canceled.

II. MANDATORY NOTICES

A. Real Party-In-Interest

Petitioner identifies Vivint, Inc. (Petitioner) as a real party-in-interest (“RPI”). Petitioner is a wholly owned subsidiary of NRG Energy, Inc., but Petitioner does not believe NRG Energy is an RPI for this Petition. Further, Petitioner does not believe that NRG Energy has been involved in any action with respect to the Challenged Claims and is solely being brought to the attention Board based on its ownership status.

B. Related Matters

The ’103 Patent is the subject of the following matter, which may be affected by a decision in this proceeding: *Fractus, S.A. v. Vivint, Inc.*, 2:22-cv-00413 (E.D. Tex.), filed on October 21, 2022 (“Litigation”). The Litigation was consolidated for pre-trial issues with a separate “Lead Case,” *Fractus, S.A. v. ADT LLC*, 2:22-cv-412 (E.D. Tex.), involving similar but separate issues and asserted claims, with only some overlapping asserted claims.

Petitioner is not aware of any post-grant proceeding before the Office involving the '103 Patent. *See* 37 C.F.R. §§42.8(b)(3), 42.8(b)(4), 42.10(a), and 42.10(b).

C. Lead Counsel, Back-Up Counsel, and Service Information

Pursuant to 37 C.F.R. §§42.8(b)(3) and 42.10(a), Petitioner designates Jared J. Braithwaite (Reg. No. 63,308) as lead counsel and R. Whitney Johnson (Reg. No. 62,997) as back-up counsel.

Pursuant to 37 C.F.R. §42.10(b), Petitioner has filed a power of attorney for the above-designated counsel.

D. Service Information

Per 37 C.F.R. §42.8(b)(4), Petitioner provides the following service information for designated counsel:

Lead Counsel	Back-Up Counsel
Jared J. Braithwaite Reg. No. 63,308 FOLEY & LARDNER LLP 95 South State Street Suite 2500 Salt Lake City, UT 84111 801-401-8900 jbraithwaite@foley.com	R. Whitney Johnson Reg. No. 62,997 FOLEY & LARDNER LLP 95 South State Street Suite 2500 Salt Lake City, UT 84111 801-401-8900 whit.johnson@foley.com

Petitioner consents to service via email at the addresses listed above.

III. PAYMENT OF FEES

The required fee is paid by credit card, with authorization to charge any fee

deficiencies and credit overpayments to Deposit Acct. No. 19-0741 (Customer No. 22428).

IV. GROUNDS FOR STANDING

Pursuant to 37 C.F.R. §42.104(a), Petitioner certifies that the '103 Patent is available for *Inter Partes* review and that Petitioner is not barred or estopped from requesting *Inter Partes* review on the Grounds identified herein.

V. PRECISE RELIEF REQUESTED

A. Identification of Claims

Pursuant to 37 C.F.R. §§42.22(a)(1) and 42.104(b), the precise relief sought by Petitioner is that the Board review and cancel Claims 12 and 15 of the '103 Patent as being unpatentable under 35 U.S.C. §§ 102 or 103, as set forth by this Petition and supported by the Declaration of Dr. Manos Tentzeris (Ex. 1002), under the following Grounds:

Ground #	Challenged Claims	Ground
1	12, 15	Obvious in view of U.S. Patent No. 6,239,765 to Johnson <i>et al.</i> ("Johnson") and U.S. Patent Application Publication No. 2007/0238483 to Boireau <i>et al.</i> ("Boireau")
2	12, 15	Obvious in view of U.S. Patent Application Publication No. 2003/0189522 to Zeilinger ("Zeilinger") and Boireau.

Petitioner establishes below that the Challenged Claims are unpatentable under the Grounds identified above, including by identifying where each claim element is found in the prior art, to demonstrate that Petitioner has at least a reasonable likelihood of prevailing on these Grounds.

B. Prior Art

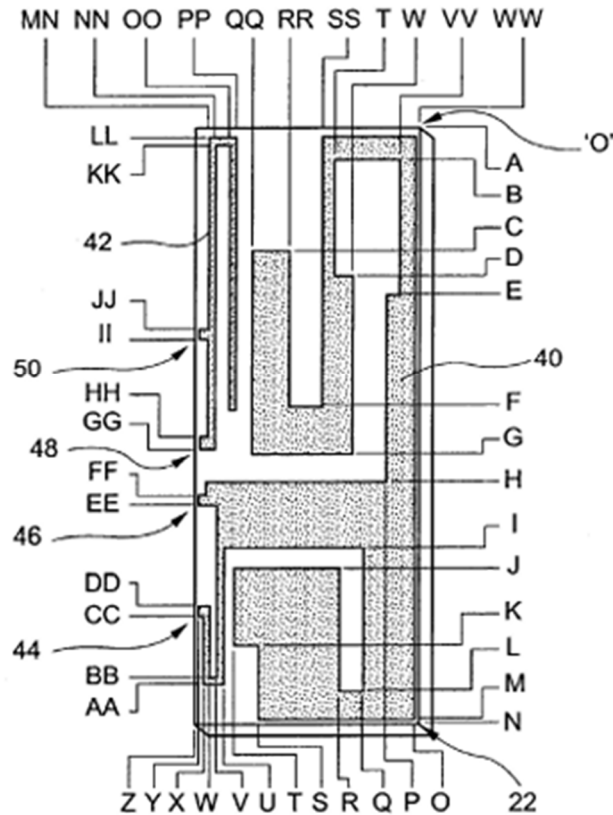
1. Johnson

U.S. Patent No. 6,239,765 to Johnson *et al.* (Ex. 1003) (“Johnson”) filed on August 24, 1999, is prior art under at least 35 U.S.C. §§ 102(a). Johnson did not provide the basis for any particular examiner remarks during prosecution of the ’103 Patent.

Johnson is directed to “[a]n asymmetric dipole antenna assembly . . . provided for wireless communications devices.” Ex. 1003 at Abstract. Like the ’103 patent’s concern for antennas in a small handheld wireless device, Johnson “replaces the external wire antenna of a wireless communication device with a planar conformal element which is installed within the housing of a wireless device.” *Id.* at 2:5-9. This means that in Johnson, “an internal antenna . . . can easily fit inside the housing of a wireless transceiver such as a cellphone.” *Id.* at 2:21-22.

Johnson teaches an “antenna assembly of FIG. 9 [that] depicts a tri-band antenna assembly 20 functioning across a cellular band (880-960 MHz.), a PCS band (1710-1880 MHz.) and the BLUETOOTH™ band (2.4-2.5 GHz.)” *Id.* at 5:37-40.

FIG. 9



Id. at FIG. 9.

2. Boireau

U.S. Patent Application Publication No. 2007/0238483 to Boireau *et al.* (Ex. 1004) (“Boireau”), filed April 5, 2006, published October 11, 2007, and is prior art under at least 35 U.S.C. §102(e). Boireau was not referenced during prosecution of the ’103 Patent.

Boireau is directed to “[a] mobile computing device [that] may comprise an

antenna, a switch to couple to the antenna, and multiple transceivers to couple to the switch.” Ex. 1004 at Abstract. Boireau discloses a “wireless device 100 may comprise a mobile computing device. A mobile computing device may include any computing device with a self-contained power source, such as a battery, for example.” *Id.* at ¶[0018]. Boireau further discloses that “mobile computing device 100 may be implemented as a combination handheld computer and mobile telephone, sometimes referred to as a smart phone.” *Id.* at ¶[0019]. The mobile computing device of Boireau may include a “display 138 [that] may be implemented as an additional I/O device, such as a touch screen, touch panel, touch screen panel, and so forth” *Id.* at ¶[0023].

Boireau teaches a “[p]rocessor 302 and transceiver module 304 [that] may communicate using various interface signals.” *Id.* at ¶[0052]. The mobile computing device of Boireau further includes “[m]emory 306 may be implemented using any machine-readable or computer-readable media capable of storing data, including both volatile and non-volatile memory.” *Id.* at ¶[0042].

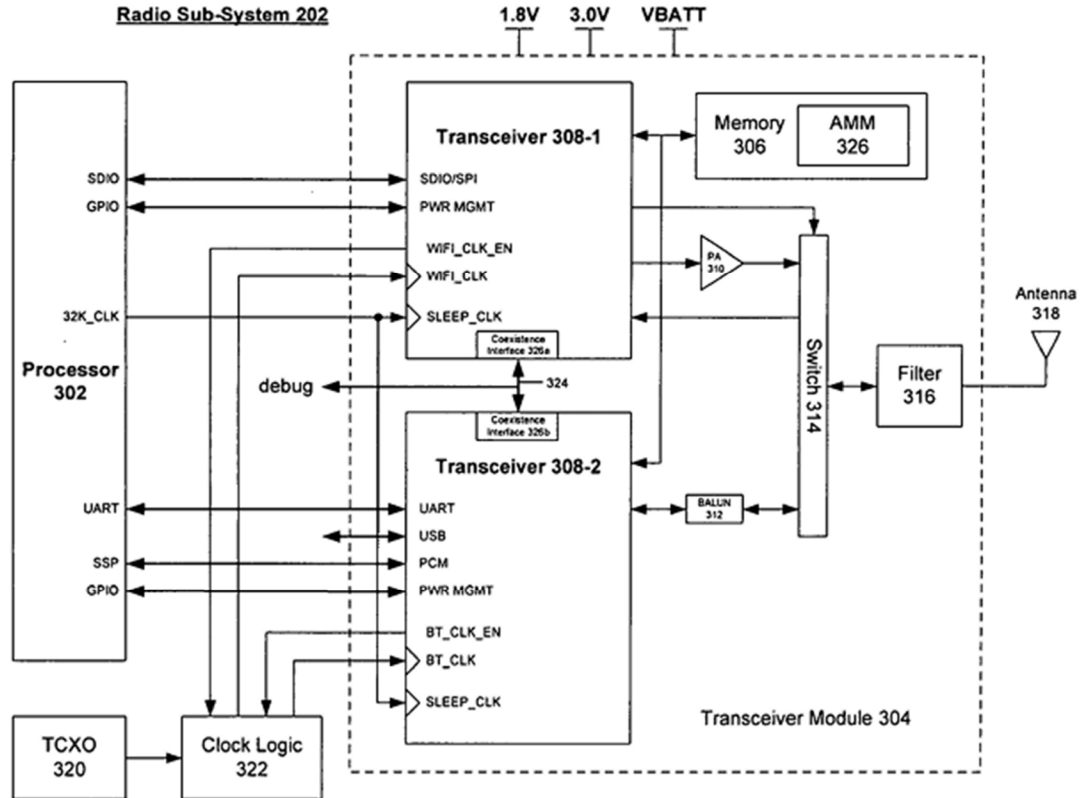


FIG. 3

Id. at FIG. 3.

3. Zeilinger

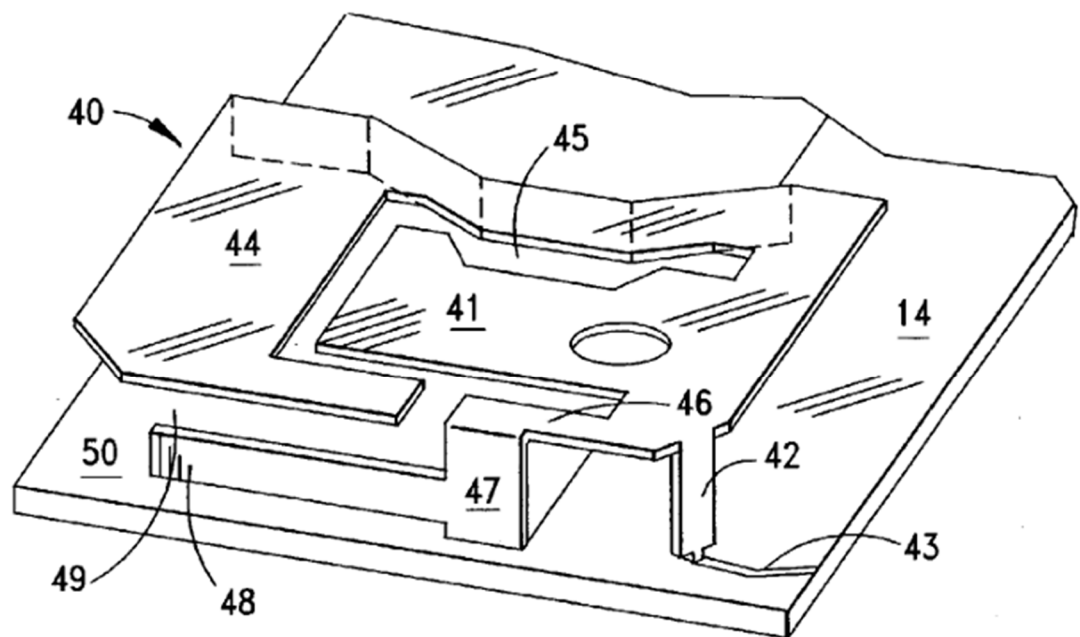
U.S. Patent Application Publication No. 2003/0189522 to Zeilinger (Ex. 1005 (“Zeilinger”)) published October 9, 2003, and is prior art under at least 35 U.S.C. §102(a)-(b). Zeilinger was not referenced during prosecution of the ’103 Patent.

Zeilinger is directed to “[a] multiple frequency band antenna [that] is capable of operating in at least three distinct preselected frequency bands.” Ex. 1005, Abstract. It is an object of Zeilinger “to provide in one embodiment of the invention,

a tri-band antenna for use with mobile telephones that is capable of operating in at least three distinct preselected frequency bands.” *Id.* at ¶[0011].

Like the ’103 patent’s concern for antennas in a small handheld wireless device, Zeilinger teaches an “antenna [that] will fit into the top portion of the internal cavity of the telephone housing 10.” *Id.* at ¶[0029].

FIG. 3



Id. at FIG. 3.

VI. THE ’103 PATENT

A. Specification

The ’103 Patent is directed to “[a] multifunction wireless device” which

“includes an antenna system.” Ex. 1001, Abstract. The ’103 Patent teaches that a “multifunction wireless device . . . advantageously comprises five functional blocks: display 11, processing module 12, memory module 13, communication module 14, and power management module 15.” *Id.* at 8:13-17. The specification then provides the following description: (1) the display can include “a touch screen with a size of at least half of the overall device, *Id.* at 9:13-14; (2) “[t]he processing module 12, that is the microprocessor or CPU,” *Id.* at 8:20-21; (3) the memory module is one of the blocks; (4) “[t]he antenna system [is] within the communication module 14,” *Id.* at 8:47; and (5) “[t]he MFWD 100 has a single source of energy and it is the power management module 15,” *Id.* at 8:26-28.

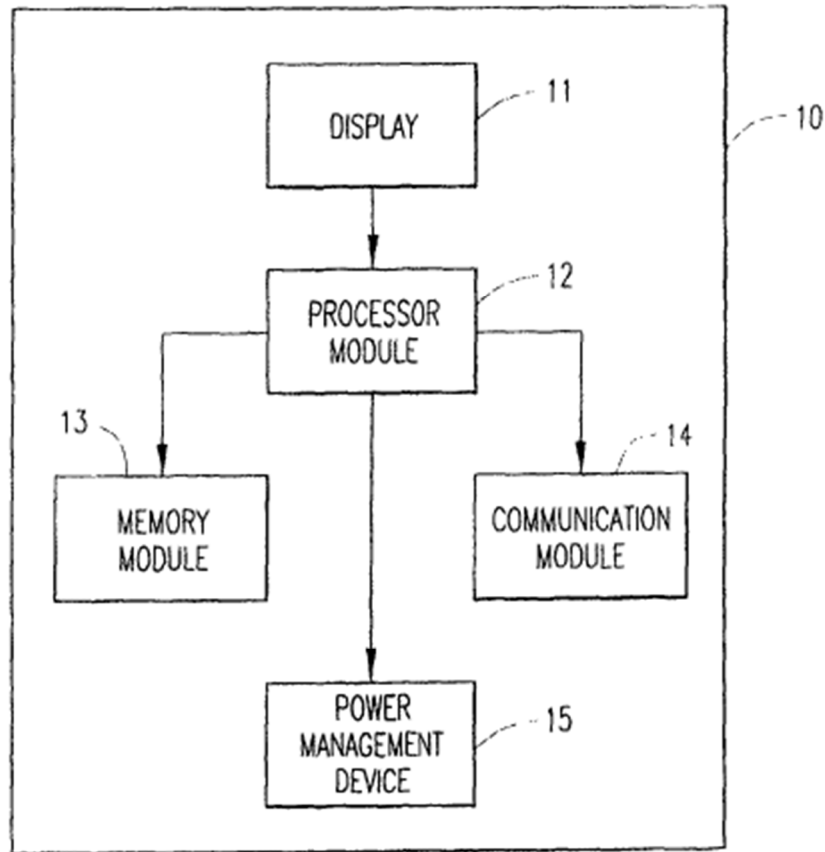


FIG. 1A

Id., at FIG. 1A.

The '103 Patent then describes the antenna system within the handheld multifunction wireless device. The antenna system includes a ground plane with a “ground plane rectangle . . . defined as being the minimum-sized rectangle that encompasses the ground plane of the antenna system included in the PCB of the MFWD 100 that comprises the feeding means responsible for the operation of the antenna system in its lowest frequency band. That is, the ground plane rectangle is

a rectangle whose edges are tangent to at least one point of the ground plane.” *Id.*
at 14:4-11.

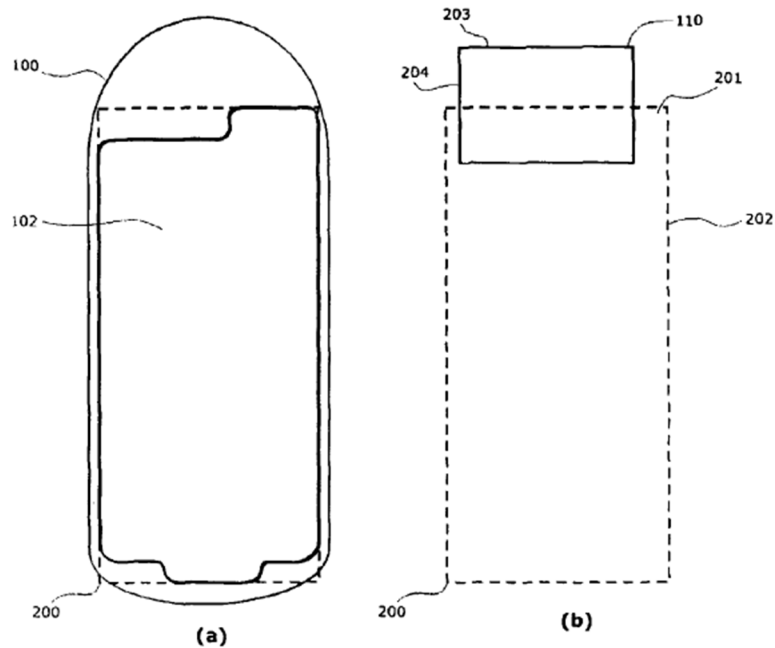


FIG. 2

Id. at FIG. 2.

The antenna system of the '103 Patent “has a structure able to support different radiation modes so that the antenna system can operate with good performance and reduced size in the communication standards allocated in multiple frequency bands within at least three different regions of the electromagnetic spectrum.” *Id.* at 11:27-31. At least one of these regions incorporates “4G standards (for instance, bands within the frequency region 2-11 GHz and some of its sub-regions such as for instance 2-11 GHz, 3-10 GHz, 2.4-2.5

GHz and 5-6 GHz or some other bands).” *Id.* at 24:27-30. The antenna contour, “i.e., its peripheral both internally and externally, can comprise straight segments, curved segments or a combination thereof.” *Id.* at 14:60-62. The ’103 Patent discloses that it is possible to require a minimum amount of segments in a contour and that “[p]ossible values for the minimum number of segments of a subset include 5, 6, 7, 8, 10, 12, 14, 16, 18, 20, 25, 30, 35, 40, 45 and 50.” *Id.* at 15:41-43.

The ’103 Patent further discloses “[a]n antenna box for the MFWD 100 is herein defined as being the minimum-sized parallelepiped of square or rectangular faces that completely encloses the antenna volume of space and wherein each one of the faces of the minimum-sized parallelepiped is tangent to at least one point of the volume. Moreover, each possible pair of faces of the minimum-size parallelepiped shares an edge forming an inner angle of 90°.” *Id.* at 11:3-12.

Within the antenna box is an antenna rectangle “defined as being the orthogonal projection of the antenna box along the normal to the face with the largest area of the antenna box.” *Id.* at 13:55-58. The ’103 Patent also discloses that “in some examples the length of the antenna contour is larger than 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 15, 20, 25, 30, 40 or more times the length of the diagonal of the antenna rectangle or less than any of those values.” *Id.* at 16:14-17.

B. Prosecution History

The application from which the '103 Patent issued (No. 11/614,429) was filed on December 21, 2006. During prosecution, the applicant filed 27 different Information Disclosure Statements ("IDS") that identified hundreds of potential prior art references.

On August 16, 2010, the examiner issued a non-final office action that rejected original claims 1-3, 6-9, 11, 14, and 20 as being unpatentable over the combination of U.S. Patent No. 7,548,915 to Ramer *et al.* ("Ramer") and U.S. Patent Application Publication No. 2004/0119644 to Baliarda *et al.* ("Baliarda"). Ex. 1007 at 162. Claims 12 and 13 were rejected as being unpatentable over a combination of Ramer, Baliarda, and U.S. Patent No. 7,183,983 to Ozden ("Ozden"). *Id.* at 174. Claims 16-19 were rejected as being unpatentable over the combination of Ramer, Baliarda, and U.S. Patent Application Publication No. 2002/0175211 to Dominquez *et al.* ("Dominquez"). *Id.* at 178. Claims 10 and 15 were rejected as being unpatentable over the combination of Ramer, Baliarda, and U.S. Patent Application No. 2007/0229383 to Koyanagi *et al.* ("Koyanagi"). *Id.* at 183. On February 11, 2011, Applicant responded and made no amendments nor cancelations to any of their claims. *Id.* at 147.

On March 7, 2011, the examiner issued a final rejection maintaining the original rejections based on the various combinations of Ramer, Baliarda, Ozden,

Dominquez, and Koyanagi. *Id.* at 117-145. Applicant requested continued examination on March 21, 2011. *Id.* at 115. Examiner issued a final rejection on May 27, 2011. *Id.* at 87-114.

On November 23, 2011, applicant filed a request for continued examination and amended the independent claims 1, 16, 18, and 20. *Id.* at 70-85. Examiner issued a non-final rejection on March 19, 2013 which stated that claims 1-3, 6-9, 11-14, and 20 were unpatentable over U.S. Patent No. 6,989,794 to Tran (“Tran”) in view of Ramer. *Id.* at 52. Claims 4-5 were rejected as being unpatentable over Tran in view of Ramer and Dominquez. *Id.* at 61. Claims 10 and 15 were rejected as being unpatentable over Tran in view of Ramer and Koyanagi. *Id.* at 62. Claim 16 was rejected as unpatentable over Tran in view of Dominquez. *Id.* at 64. Claim 17 was rejected as being unpatentable over Tran in view of Dominquez and Ramer. *Id.* at 66. Claims 18-19 were rejected as being unpatentable over U.S. Patent No. 6,476,769 to Lehtola (“Lehtola”) in view of Ramer and Dominquez. *Id.* at 67.

On July 17, 2013, Applicant canceled claims 1-20 and added claims 21-40. *Id.* at 35-48. Examiner responded that the amendment was non-responsive and withdrew new claims 21-40 from consideration as being directed to a non-elected invention. *Id.* at 32-34. Applicant responded on November 13, 2013, by amending claims 1-5 and 16-20, canceling claims 6-15, and adding claims 21-30. *Id.* at 10-30. A notice of allowance was issued on January 8, 2014. Ex. 1007 at 7-9.

VII. LEVEL OF ORDINARY SKILL IN THE ART

According to the Patent Owner in the Litigation, a person of ordinary skill in the art (“POSITA”) as of the earliest claimed priority date of July 18, 2006¹ would have had “at least a bachelor’s degree in electrical engineering, computer science, or a similar degree and at least four years of experience in applied electromagnetics with an emphasis on antennas.” Alternatively, the person of ordinary skill in the art would have a master’s degree in electrical engineering (or similar discipline) and at least two years of similar experience. Ex. 1008, ¶32.²

VIII. CLAIM CONSTRUCTION

A claim is construed in an IPR proceeding using the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316-1317 (Fed. Cir. 2005) (en banc). 37 C.F.R. §42.100(b). Except as discussed specifically below, Petitioner submits that the Board need not specially construe any terms of the Challenged Claims to institute IPR because they are shown to be anticipated and/or obvious regardless of

¹ While not disputed for purposes of the asserted Grounds, Petitioner reserves the right to dispute the priority claim of the Challenged Claims in other proceedings.

² While not disputed for purposes of the asserted Grounds, Petitioner reserves the right to dispute the Patent Owner’s asserted description of the level of ordinary skill in the art.

construction. *Toyota Motor Corp. v. Cellport Sys., Inc.*, IPR2015-00633, Paper 11, 16 (PTAB Aug. 14, 2015). Petitioner reserves all rights to raise claim construction and related challenges under 35 U.S.C. §112 in other proceedings.

IX. GROUNDS OF UNPATENTABILITY

As established below, all features of the Challenged Claims were well known in the prior art.

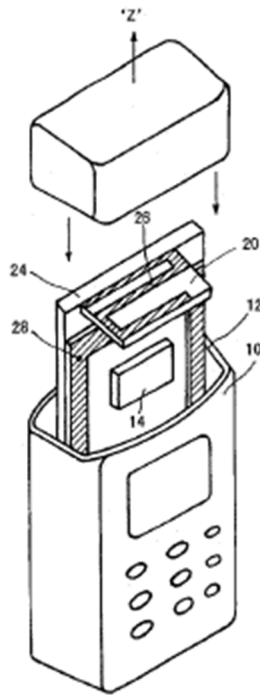
A. Ground 1: Claims 12 and 15 Rendered Unpatentable by Johnson Alone or in Combination with Boireau

Johnson anticipates and/or renders obvious each and every limitation recited in claims 12 and 15 of the '103 Patent either alone or in combination with Boireau.

1. Claim 12

- i. “A handheld multifunction wireless device having at least one of multimedia functionality and smartphone functionality, the handheld multifunction wireless device comprising:” (preamble)**

To the extent the preamble is limiting, Johnson discloses this claim limitation. For example, the following passages and figures (and their corresponding disclosures) disclose a handheld multifunction wireless device having at least one of multimedia functionality and smartphone functionality, the handheld multifunction wireless device:



Ex. 1003 at FIG. 1.

Johnson teaches that “[t]he present invention replaces the external wire antenna of a wireless communication device with a planar conformal element which is installed within the housing of a wireless device and closely-spaced to the printed circuit board and antenna feedpoint of the wireless device. Electrical connection to the wireless device's main PWB may be achieved through automated production equipment, resulting in cost effective assembly and production. Electrical performance of the internal (embedded) antenna in wireless systems is nominally equal to that of a conventional wire antenna.” *Id.* at 2:5–14. The wireless device shown and described in Johnson is a handheld multifunction wireless device, such as a mobile phone. Ex. 1002 at ¶58. The wireless device

includes smartphone functionality and multimedia functionality. Indeed, Johnson describes that “[a]n asymmetric dipole antenna assembly is provided for wireless communications devices, and includes separate upper and lower conductor traces and a low impedance feedpoint at the junction of the conductor traces.” Ex. 1003 at Abstract. Johnson further teaches “single or multiple frequency wireless communication devices, for instance devices operating over the GPS (1575 MHz), cellular telephone (824-890 MHz and 860-890 MHz), PCS device (1710-1880 MHz, 1750-1870 MHz, and 1850-1990 MHz), cordless telephone (902-928 MHz), or BLUETOOTH™ specification (2.4-2.5 GHz.) frequency ranges. *Id.* at 3:49-55. The frequency ranges that are enabled by the antenna of Johnson allow the wireless communication device to perform multimedia and/or smartphone functionality for “known wireless communication devices,” which the ’103 patent admits included smartphones with multimedia capabilities. *See Id.* at 1:20-23; Ex. 1001 at 1:19-35.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole. Ex. 1002 at ¶63.

ii. “a touch screen;”

Boireau discloses this claim limitation. For example, Boireau teaches that a “[m]obile computing device 100 may comprise various input/output (I/O) devices. Such as an alphanumeric keyboard, alphanumeric keypad, numeric keys, keys, buttons, switches, rocker switches, multi-directional rocker switches, a microphone,

an audio headset, a camera, a touch-sensitive display screen, a stylus, and so forth.” Ex. 1004 at ¶[0021].

As set forth below, a POSITA would have had reason to combine Johnson and Boireau, and would have had a reasonable expectation of success in doing so. Ex. 1002 at ¶¶66-67. Further, a POSITA would have understood that the combination would have been successful in creating a smaller antenna system while enhancing wireless connectivity. *Intel Corp. v. Pact XPP Schweiz AG*, 2022-1037, 13 (Fed. Cir. Mar. 13, 2023) (“It’s enough for [Petitioner] to show that there was a known problem...in the art, that [a secondary reference]...helped address that issue, and that combining the teachings of [the art and the secondary reference]...wasn’t beyond the skill of an ordinary artisan. Nothing more is required to show a motivation to combine under [*KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007)]....”).

Johnson and Boireau are analogous art directed to the same field of endeavor as the ’103 Patent (*i.e.*, antenna designs). Ex. 1003 at 1:13–30; Ex. 1004 at ¶[0001]. Like the ’103 Patent, Johnson and Boireau are directed to the same problem of improving antenna geometry for small devices. Ex. 1003 at 1:13–30; Ex. 1004 at ¶[0001]. It would have been obvious to combine the teachings of Boireau with those of Johnson because a person of ordinary skill would have

found it obvious to use the antennas of Johnson with any of a variety of mobile phones at the time, including those with a touch screen as disclosed by Boireau. Ex. 1002 at ¶69.

iii. “a processing module;”

Johnson discloses this claim limitation. For example, Johnson teaches that “[t]he present invention replaces the external wire antenna of a wireless communication device with a planar conformal element which is installed within the housing of a wireless device and closely-spaced to the printed circuit board and antenna feedpoint of the wireless device. Electrical connection to the wireless device's main PWB may be achieved through automated production equipment, resulting in cost effective assembly and production. Electrical performance of the internal (embedded) antenna in wireless systems is nominally equal to that of a conventional wire antenna.” Ex. 1003 at 2:6–14. As clearly described above, Johnson discloses “an antenna assembly for a wireless communication device, such as a cellular telephone.” *Id.* at 1:11-17. The ’103 patent defines the processing module to be “the microprocessor or CPU.” Ex. 1001 at 8:20-21. A person of ordinary skill would understand that the cellular telephone of Johnson includes a processing module. Ex. 1002 at ¶73. However, to the extent that a processing module is not explicitly described in Johnson, Boireau describes “[h]ousing 102 may be used to encapsulate various internal components for mobile computing

device 100, such as a processor, a memory, one or more transceivers, one or more printed circuit board (PCB), one or more antennas, a stylus, and so forth.” Ex. 1004 at ¶[0020].

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶75.

Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Johnson because a person of ordinary skill would have found it obvious to use the antennas of Johnson with any of a variety of mobile phones at the time, which included processors as disclosed by Boireau. *Id.* at ¶76.

iv. “a memory module;”

The ’103 patent does not describe the “memory module.” Nonetheless, Johnson discloses this claim limitation. For example, Johnson teaches that “[t]he present invention replaces the external wire antenna of a wireless communication device with a planar conformal element which is installed within the housing of a wireless device and closely-spaced to the printed circuit board and antenna feedpoint of the wireless device. Electrical connection to the wireless device's main PWB may be achieved through automated production equipment, resulting in cost effective assembly and production. Electrical performance of the internal

(embedded) antenna in wireless systems is nominally equal to that of a conventional wire antenna.” Ex. 1003 at 2:6–14. Johnson discloses “an antenna assembly for a wireless communication device, such as a cellular telephone.” *Id.* at 1:11-17. A person of ordinary skill would understand that the cellular telephone of Johnson includes a memory module. Ex. 1002 at ¶81. However, to the extent that a memory module is not explicitly described in Johnson, Boireau describes “[h]ousing 102 may be used to encapsulate various internal components for mobile computing device 100, such as a processor, a memory, one or more transceivers, one or more printed circuit board (PCB), one or more antennas, a stylus, and so forth.” Ex. 1004 at ¶[0020].

One of ordinary skill would find this limitation disclosed in the teaching of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶83.

Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Johnson because a person of ordinary skill would have found it obvious to use the antennas of Johnson with any of a variety of mobile phones at the time, which included memory as disclosed by Boireau. *Id.* at ¶84.

v. “a communication module;”

The ‘103 patent states the communications module is, for example, and

antenna. Ex. 1001 at 8:47. Thus, Johnson discloses this claim limitation. For example, Johnson teaches “[a]n asymmetric dipole antenna assembly is provided for wireless communications devices, and includes separate upper and lower conductor traces and a low impedance feedpoint at the junction of the conductor traces.” Ex. 1003 at Abstract. Johnson also teaches that “[t]he present invention replaces the external wire antenna of a wireless communication device with a planar conformal element which is installed within the housing of a wireless device and closely-spaced to the printed circuit board and antenna feedpoint of the wireless device. Electrical connection to the wireless device's main PWB may be achieved through automated production equipment, resulting in cost effective assembly and production. Electrical performance of the internal (embedded) antenna in wireless systems is nominally equal to that of a conventional wire antenna.” *Id.* at 2:6–14. Johnson also discloses a transceiver 14, the purpose of which is to carry out wireless communications. *Id.* at 2:50-54; Ex. 1002 at ¶90. A person of ordinary skill at the time of the invention would have understood that Johnson’s disclosure of a wireless device, and an antenna and a transceiver includes a communication module to carry out wireless communication. *Id.* at ¶91.

In addition, Johnson teaches “an internal antenna that can easily fit inside the housing of a wireless transceiver such as a cellphone.” Ex. 1003 at 2:21-22. A

person of ordinary skill would have known that a cellphone at the time had a communication module including a wireless transceiver. Ex. 1002 at ¶92.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶93.

vi. “a power management module;”

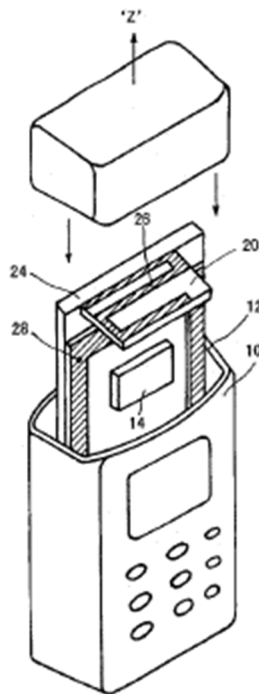
The '103 Patent describes the power management module as the “single source of energy” for the MFWD (wireless device). Ex. 1001 at 8:26-28. Thus, Johnson discloses this claim limitation. For example, Johnson teaches “[a]n asymmetric dipole antenna assembly is provided for wireless communications devices, and includes separate upper and lower conductor traces and a low impedance feedpoint at the junction of the conductor traces.” Ex. 1003 at Abstract. To the extent that a power management module is not explicitly described in Johnson, Boireau describes that “[m]obile computing device 100 also may comprise a rechargeable battery, such as a removable and rechargeable lithium ion battery, and an alternating current (AC) adapter.” Ex. 1004 at ¶[0022]. A battery as disclosed in Boireau would meet the “source of energy” description for a power management module. Ex. 1002 at ¶98.

One of ordinary skill would find this limitation disclosed in the teachings of

Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶99. Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Johnson because a person of ordinary skill would have found it obvious to use the antennas of Johnson with any of a variety of mobile phones at the time, which included power management modules (e.g., batteries) as disclosed by Boireau. *Id.* at ¶100.

vii. “an antenna system within the handheld multifunction wireless device and comprising:”

Johnson discloses this claim limitation. For example, the following written description discloses an antenna system:



Ex. 1003 at FIG. 1.

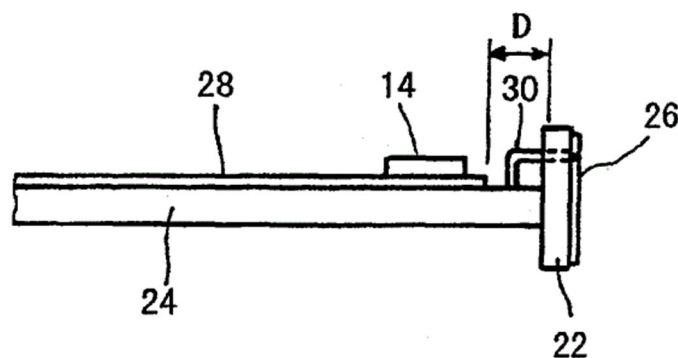
Johnson teaches “[a]n asymmetric dipole antenna assembly is provided for wireless communications devices, and includes separate upper and lower conductor traces and a low impedance feedpoint at the junction of the conductor traces.” Ex. 1003 at Abstract. Johnson also teaches “an internal antenna that can easily fit inside the housing of a wireless transceiver such as a cellphone.” *Id.* at 2:21-22. A cellphone would constitute a multifunction wireless device at the time of invention. Ex. 1002 at ¶103. It is clear that Johnson discloses an antenna system within a multifunction wireless device because the antenna fits inside the housing of the cellphone disclosed in Johnson.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶105.

viii. “a ground plane layer;”

Johnson discloses this claim limitation. For example, Johnson teaches that “[t]he present invention provides an antenna assembly including a first planar element having a conductive trace, and at least one conductive member disposed near the first element to jointly form an asymmetrical dipole antenna. The resonant frequency range of the dipole is primarily determined by the dimensions

of the conductive trace on the first planar element, which may be selected to exhibit $\frac{1}{4}$ wave resonance. The elongate second element has a minimum electrical length dimension of $\frac{1}{4}$ wavelength at the lowest frequency of operation, and may consist solely of the ground traces of the printed wiring board(s) of a wireless transceiver such as a cellular telephone.” Ex. 1003 at 2:32–42.



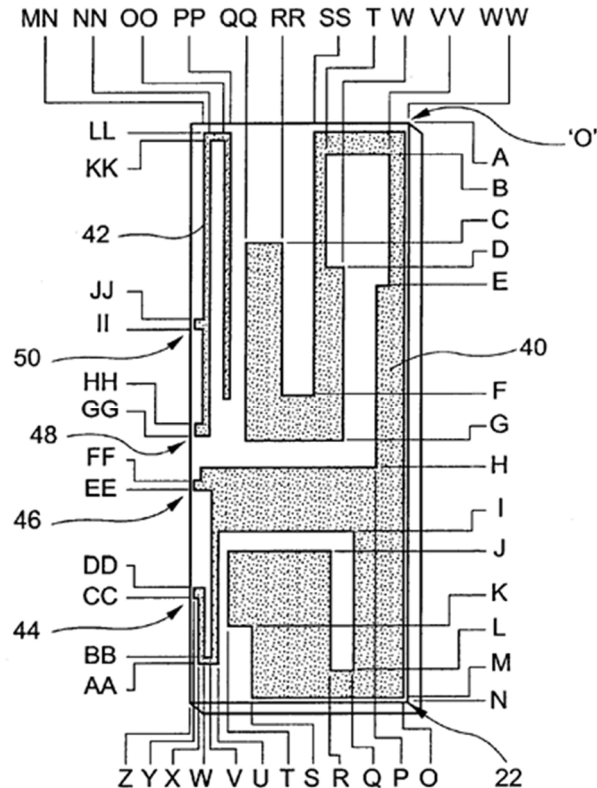
Id. at FIG. 2.

Johnson teaches that “[t]he conductor trace 26 is disposed upon a single major surface of the first planar element 22 and is operatively coupled to the transceiver electronics 14 of the second planar element 24 via a feedpoint 32. One end 34 of the conductive trace 26 is coupled to the second conductive trace 28 (the ground plane of the second planar element 24) via leads 36 or other electrical connection.” *Id.* at 4:55-62.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole. Ex. 1002 at ¶109.

- ix. “a first antenna element configured to simultaneously support radiation modes for first, second, and third frequency bands,”

Johnson discloses this claim limitation or at least renders it obvious. For example, the following figures and their corresponding written description disclose a first antenna element configured to simultaneously support radiation modes for first, second, and third frequency bands:



Ex. 1003 at FIG 9.

Johnson teaches that “FIG. 9 illustrates a front elevational view of a tri-band antenna assembly according to the present invention;” *Id.* at 3:33–34.

Johnson also teaches that “FIG. 9 illustrates another embodiment of the present invention. The antenna assembly of FIG. 9 depicts a tri-band antenna assembly 20 functioning across a cellular band (880-960 MHz.), a PCS band (1710-1880 MHz.) and the BLUETOOTH™ band (2.4-2.5 GHz.). Cellular and PCS band operation is effected through first conductor trace 40. BLUETOOTH™ band operation is effected through conductor trace 42.” *Id.* at 5:35–42.

Johnson also teaches “[r]eferring now to the drawings, wherein like numerals depict like parts throughout, preferred embodiments of an antenna assembly 20 according to the present invention are illustrated in FIGS. 1-12. The antenna assembly 20 may implemented within single or multiple frequency wireless communication devices, for instance devices operating over the GPS (1575 MHz), cellular telephone (824-890 MHz and 860---890 MHz), PCS device (1710-1880 MHz, 1750-1870 MHz, and 1850-1990 MHz), cordless telephone (902-928 MHz), or BLUETOOTH™ specification (2.4-2.5 GHz.) frequency ranges. Those skilled in the relevant arts may appreciate that principles of the present invention are equally applicable for antenna assemblies operating at alternative frequency ranges. In alternative embodiments, the dimensions of the antenna assembly 20 may be scaled in proportion to provide operation at other frequencies, including frequencies in the 800 MHz. to 3,000 MHz. range. Such modifications are considered within the scope of the applicant's claims.” *Id.* at

3:45-62.

One of ordinary skill would find this limitation disclosed or rendered obvious in light of the teachings of Johnson and its incorporated disclosures taken as a whole. Ex. 1002 at ¶¶ 113-114.

x. “the first frequency band being contained within a first frequency region of an electromagnetic spectrum,”

Johnson discloses this claim limitation. For example, Johnson teaches that “FIG. 9 illustrates another embodiment of the present invention. The antenna assembly of FIG. 9 depicts a tri-band antenna assembly 20 functioning across a cellular band (880-960 MHz.), a PCS band (1710-1880 MHz.) and the BLUETOOTH™ band (2.4-2.5 GHz.). Cellular and PCS band operation is effected through first conductor trace 40. BLUETOOTH™ band operation is effected through conductor trace 42.” Ex. 1003 at 5:35–42.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶117.

xi. “the second frequency band being contained within a second frequency region of the electromagnetic spectrum that is higher in frequency than the first frequency region,”

Johnson discloses this claim limitation. For example, Johnson teaches that

“FIG. 9 illustrates another embodiment of the present invention. The antenna assembly of FIG. 9 depicts a tri-band antenna assembly 20 functioning across a cellular band (880-960 MHz.), a PCS band (1710-1880 MHz.) and the BLUETOOTH™ band (2.4-2.5 GHz.). Cellular and PCS band operation is effected through first conductor trace 40. BLUETOOTH™ band operation is effected through conductor trace 42.” Ex. 1003 at 5:35–42.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶120.

xii. “the third frequency band of operation being used by a 4 G communication standard,”

Johnson discloses this claim limitation. For example, Johnson teaches that “FIG. 9 illustrates another embodiment of the present invention. The antenna assembly of FIG. 9 depicts a tri-band antenna assembly 20 functioning across a cellular band (880-960 MHz.), a PCS band (1710-1880 MHz.) and the BLUETOOTH™ band (2.4-2.5 GHz.). Cellular and PCS band operation is effected through first conductor trace 40. BLUETOOTH™ band operation is effected through conductor trace 42.” Ex. 1003 5:35–42. BLUETOOTH™ operating between 2.4-2.5 GHz falls within the range “of operation used by a 4G communication standard.” Ex. 1002 at ¶123.

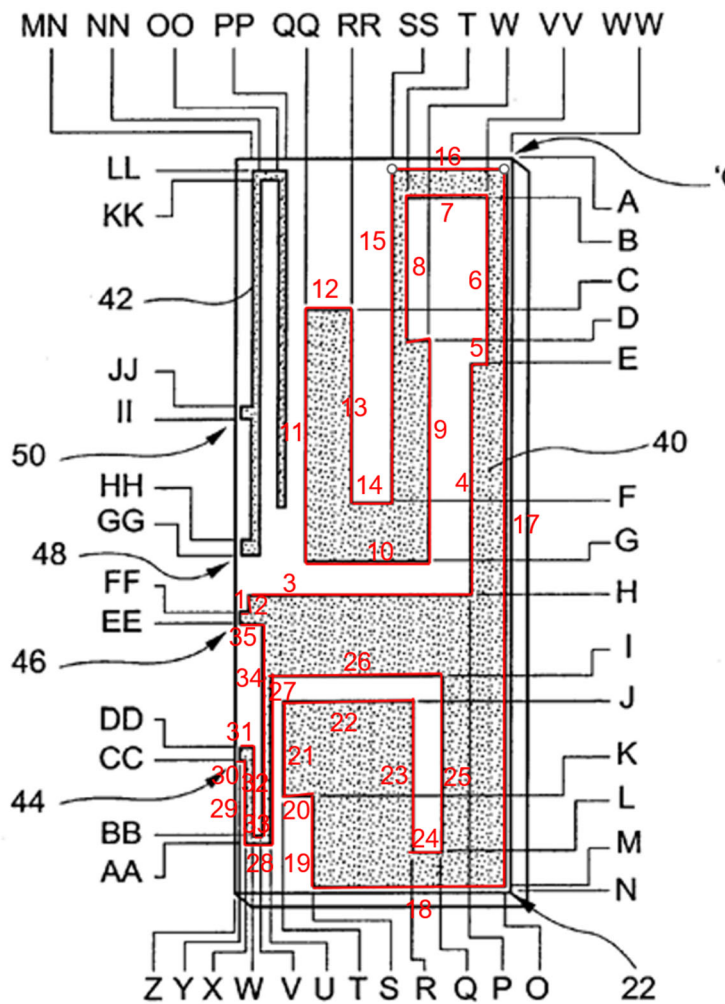
The '103 patent itself includes “3G and other advanced services for instance HSDPA, WiBro, WiFi, WiMax, UWB or other high speed wireless standards,” as among those referred to by the '103 patent as “4G services” and “might require operation in additional frequency bands corresponding to said 4G standards (for instance, bands within the frequency region 2-11 GHz and some of its sub-regions such as for instance 2-11 GHz, 3-10 GHz, 2.4-2.5 GHz and 5-6 GHz or some other bands).” Ex. 1001, 24:22-30.³ Certainly, the antennas taught by Johnson are configured to transmit and receive such high speed signals within the broad scope of “4G” provided in the '103 patent. *Id.* at 24:22-30.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶126.

³ As explained by Dr. Tentzeris, this definition by the '103 Patent is at odds with the traditional applications of the “4G” moniker which does not include, for example, 3G or WiFi. Ex. 1002, ¶124. However, “the inventor’s lexicography governs” if the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess.” *Phillips v. AWH Corp.*, 415 F.3d 13016 (Fed. Cir. 2005). That is not to say that the description in the '103 patent for “4G” is reasonably certain, and, in the Litigation, Petitioner asserts that “4G communication standard” would not have a reasonably certain meaning at the time of the invention and is therefore indefinite.

xiii. “wherein a perimeter of the first antenna element defines a first antenna contour comprising at least thirty-five segments,”

The '103 patent states that “Along the contour different segments can be identified e.g. by a corner between two segments, wherein the corner is given by a point on the contour where no unique tangent can be identified.” Ex. 1001 at 15:4-7. Thus, Johnson discloses this claim limitation. For example, the following figures and their corresponding written description disclose a perimeter of the first antenna element defines a first antenna contour comprising at least thirty-five segments:



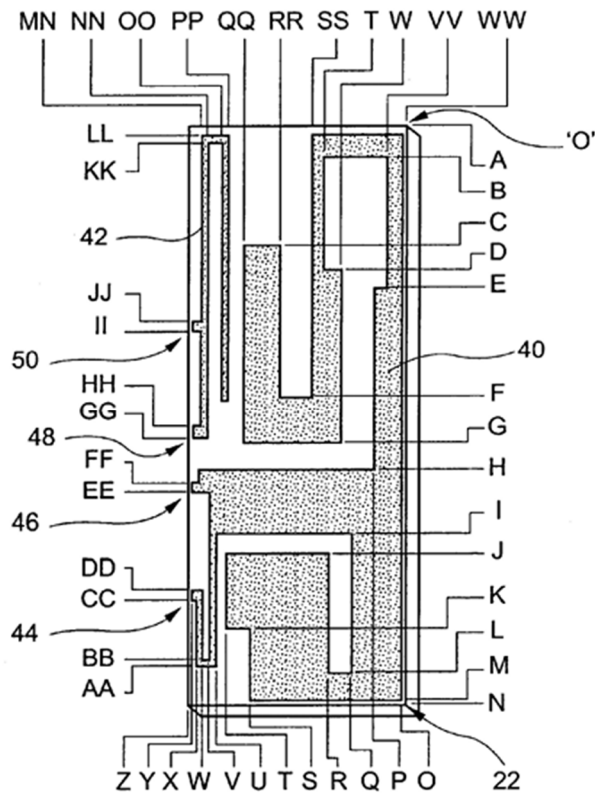
Ex. 1003 at FIG 9 (annotations added). The perimeter of the first antenna element discloses at least thirty-five segments, e.g., at least the 35 segments in the annotated figure above. Ex. 1002 at ¶128.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶129.

- xiv. “the first antenna element defining an antenna box, an orthogonal projection of the antenna box along a

**normal to a face with a largest area of the antenna box
defining an antenna rectangle,”**

Johnson discloses this claim limitation. For example, the following figures and their corresponding written description disclose a first antenna element defining an antenna box, an orthogonal projection of the antenna box along a normal to a face with a largest area of the antenna box defining an antenna rectangle:



Ex. 1003 at FIG 9.

The figure above shows a view of the antenna that by definition forms

planar antenna defining an antenna box and an antenna rectangle. Ex. 1002 at ¶131.

The antenna rectangle being an orthogonal projection of the antenna box along a normal to a face with a largest area. *Id.*

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶132.

xv. “wherein a length of the first antenna contour is greater than four times a diagonal of the antenna rectangle; and”

Johnson discloses this claim limitation. For example, Dimensions for preferred embodiments of the antenna assembly of FIG. 10 of Johnson are included in Table 1. Horizontal and vertical dimensions are measured with respect to origin point ‘O’.

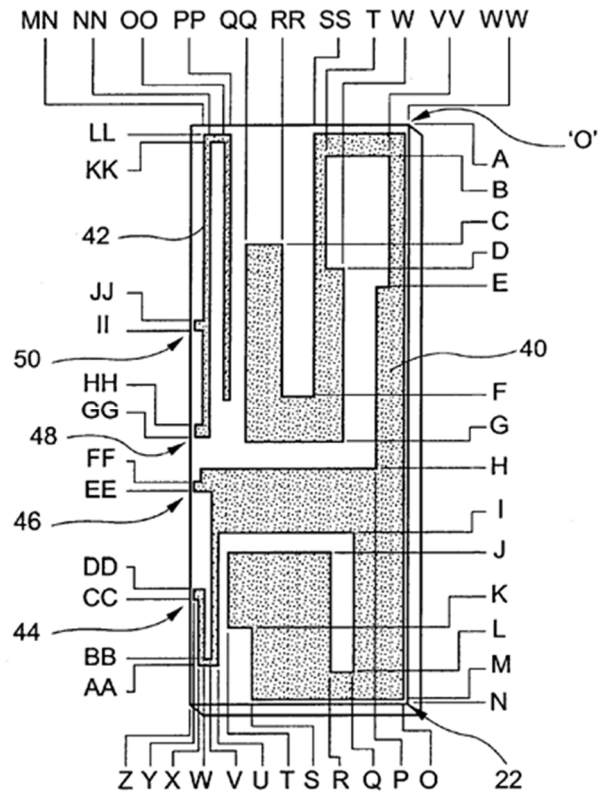
TABLE 1	
Position	Distance from Origin Point ‘O’ (Inches)
A	0.000
B	.075–1.905
C	.305–7.747
D	.365–9.271
E	.415–10.541
F	.703–17.856
G	.820–20.828
H	.885–22.479
I	1.048–26.619
J	1.080–27.432
K	1.300–33.020
L	1.415–35.941
M	1.485–37.719
N	1.500–38.100
O	.015–.381

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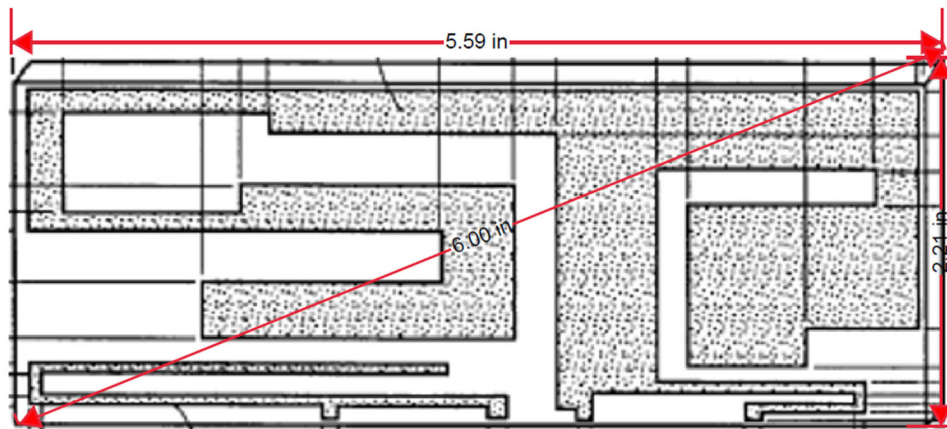
TABLE 1-continued

Position	Distance from Origin Point 'O' (Inches)
P	.105–2.667
Q	.151–3.835
R	.216–5.486
S	.422–10.719
T	.484–12.294
U	.529–13.437
V	.544–13.818
W	.559–14.199
X	.574–14.580
Y	.585–14.860
Z	.600–15.240
AA	1.400–35.560
BB	1.385–35.179
CC	1.227–31.166
DD	1.202–30.531
EE	.953–24.206
FF	.928–23.571
GG	.807–20.500
HH	.782–19.863
II	.532–13.513
JJ	.507–12.878
KK	.040–1.016
LL	.015–.381
MM	.560–14.224
NN	.545–13.843
OO	.515–13.081
PP	.500–12.700
QQ	.450–11.430
RR	.360–9.144
SS	.280–7.112
TT	.245–6.223
UU	.193–4.902
VV	.075–1.905
WW	0.000

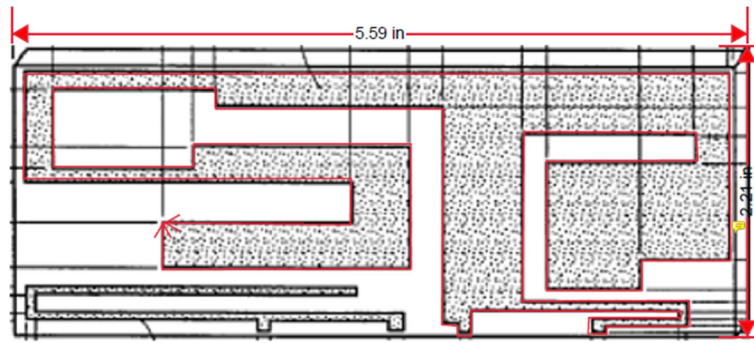
Ex. 1003 at 5:35–6:33.



Id. at FIG. 9.



Id. at FIG 9 (annotated showing a diagonal (D) of 6 such that four times D is 24).



Id. at FIG 9 (cropped and annotated, showing a length of Contour 1 as 35.05).

Thus, using the dimensions of Figure 9 on the page, measured in inches for example, but unit agnostic because the measurements are relative, the annotated figures show that Contour 2 alone (and clearly in combination with Contour 1) is more than four times the diagonal of the antenna rectangle. Ex. 1002 at ¶135.

One of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶136.

- xvi. **“a second antenna element configured to operate in at least one frequency band used by a 4 G communication standard, wherein a perimeter of the second antenna element defines a second antenna contour comprising at least twenty segments.”**

Johnson discloses this claim limitation. For example, the following figures and their corresponding written description disclose a second antenna element configured to operate in at least one frequency band used by a 4 G communication standard, wherein a perimeter of the second antenna element

defines a second antenna contour comprising at least twenty segments:

Johnson discloses “Referring now to the drawings, wherein like numerals depict like parts throughout, preferred embodiments of an antenna assembly 20 according to the present invention are illustrated in FIGS. 1-12. The antenna assembly 20 may implemented within single or multiple frequency wireless communication devices, for instance devices operating over the GPS (1575 MHz), cellular telephone (824-890 MHz and 860---890 MHz), PCS device (1710-1880 MHz, 1750-1870 MHz, and 1850-1990 MHz), cordless telephone (902-928 MHz), or BLUETOOTH™ specification (2.4-2.5 GHz.) frequency ranges. Those skilled in the relevant arts may appreciate that principles of the present invention are equally applicable for antenna assemblies operating at alternative frequency ranges. In alternative embodiments, the dimensions of the antenna assembly 20 may be scaled in proportion to provide operation at other frequencies, including frequencies in the 800 MHz. to 3,000 MHz. range. Such modifications are considered within the scope of the applicant's claims.” Ex. 1003 at 3:45-62. Thus, Johnson teaches scaling a first antenna and adding a second antenna to provide functionality in at other frequency ranges in addition to the frequency ranges provided by the first antenna. Thus, Johnson teaches, or at the very least, a person of skill in the art would have found it obvious in view of Johnson’s teachings, to use multiple antennas, perhaps scaled, for use in wireless

devices with the desired frequency responses. Accordingly, one of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶140.

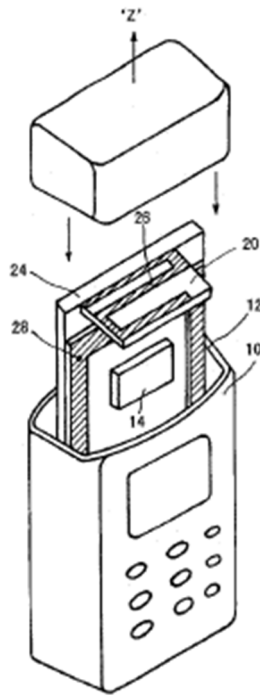
2. Claim 15

i. “The handheld multifunction wireless device according to claim 12,”

See Claim 12 above.

ii. “wherein the ground plane layer defines a ground plane rectangle, the projection of the antenna rectangle on the ground plane rectangle partially overlapping the ground plane rectangle.”

Johnson discloses this claim limitation. For example, the following figures and their corresponding written description disclose a ground plane layer that defines a ground plane rectangle, the projection of the antenna rectangle on the ground plane rectangle partially overlapping the ground plane rectangle:



Ex. 1003 at FIG. 1 (showing 28 “the ground plane circuit”).

Johnson teaches “the antenna assembly 20 includes first and second planar elements 22, 24 disposed in substantially perpendicular relationship. A first conductor trace 26 is disposed upon the first planar element 22, and a second conductor trace 28 is disposed upon the second planar element 24. The first conductor trace 26 is operatively coupled to the transceiver signal input/output componentry 14 via connection 30.” *Id.* at 4:7–17. “[T]he second conductor trace 28 is the printed ground plane circuit of the transceiver 14.” *Id.* at 4:24-25.

As shown in Figs 2-4, the antenna element may be placed in a variety of configurations with respect to the ground plane element, including those where

the projection of the antenna rectangle form by the first element on the ground plane rectangle partially overlaps the ground plane rectangle. For example, “[i]n FIG. 2, portions of the first planar element 22 are disposed relative both major surfaces of the second planar element 24 (a “T” shaped configuration), as opposed to FIG. 3, where the first planar element 22 extends from one major surface of the second planar element 24 (an “L” shaped configuration). *Id.* at 4:41-46.

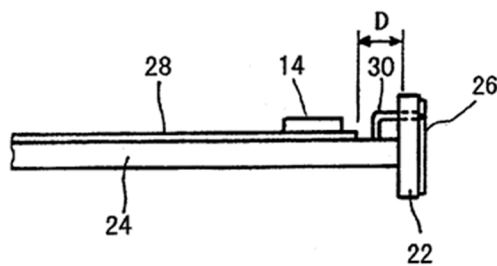


FIG. 2

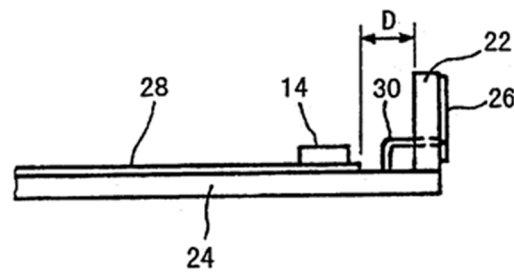


FIG. 3

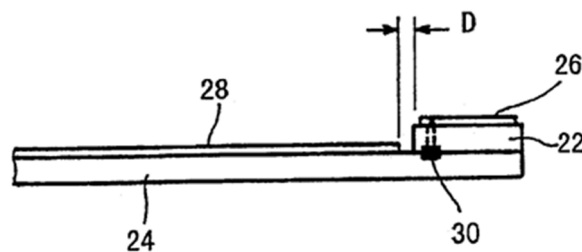


FIG. 4

Additionally, “FIG. 4 illustrates another embodiment of assembly 20 wherein the first and second planar elements 22, 24 are disposed in parallel

orientation. The isolation distance D is approximately 1 millimeter (at 900 MHz.). The first conductive trace 26 may be operatively coupled to the transceiver 14 through known surface mount interconnections 30.” *Id.* at 4:47-53.

Accordingly, one of ordinary skill would find this limitation disclosed in the teachings of Johnson and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶147.

B. Ground 2: Claims 12 and 15 Rendered Unpatentable by Zeilinger Alone or in Combination with Boireau

Zeilinger anticipates and/or renders obvious each and every limitation recited in claims 12 and 15 of the ’103 Patent either alone or in combination with Boireau.

1. Claim 12

- i. “A handheld multifunction wireless device having at least one of multimedia functionality and smartphone functionality, the handheld multifunction wireless device comprising:” (preamble)**

To the extent that the preamble is limiting, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones known to have multimedia functionality or smartphone functionality. For example, “FIG. 1 illustrates a mobile telephone housing 10 which is exemplary of the environment in which antennas of the present invention are used. As is known, the telephone housing 10 is formed from suitable plastic in the form of a

hollow shell 11 having an internal cavity 12 surrounded by exterior sidewalls 13a, 13b. One or more printed circuit boards 14, 20 may be provided and supported within the cavity 12. Integrated circuits 15 in the form of chips 16 that power different aspects of the telephone may be supported on the circuit boards 14 and terminated to various circuits thereon.” Ex. 1005 at ¶[0024].

Boireau also discloses this. For example, the following figures and the corresponding written description disclose a handheld multifunction wireless device having at least one of multimedia functionality and smartphone functionality:

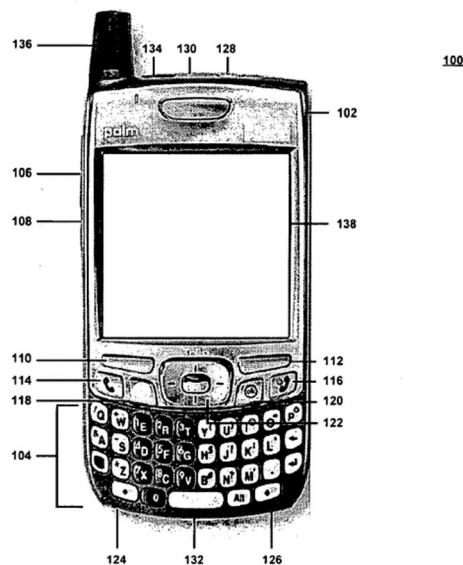
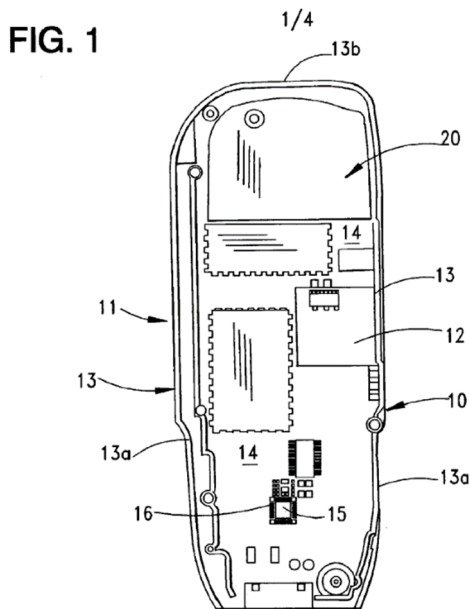


FIG. 1

Ex. 1004 at FIG. 1.

Boireau teaches that “FIG. 1 illustrates one embodiment of a wireless

device 100. Wireless device 100 may comprise any device having a wireless transceiver arranged to communicate over one or more portions of a radio-frequency (RF) spectrum. In one embodiment, for example, wireless device 100 may comprise a mobile computing device.” Ex. 1004 at ¶[0018].



Ex. 1005 at FIG. 1.

As set forth below, a POSITA would have had reason to combine Zeilinger and Boireau , and would have had a reasonable expectation of success in doing so. Ex. 1002 at ¶¶154-155. Further, a POSITA would have understood that the combination would have been successful in creating a smaller antenna system while enhancing wireless connectivity. *Intel Corp. v. Pact XPP Schweiz AG*, 2022-1037, 13 (Fed. Cir. Mar. 13, 2023) (“It’s enough for [Petitioner] to show that there was a known problem...in the art, that [a secondary reference]...helped

address that issue, and that combining the teachings of [the art and the secondary reference]...wasn't beyond the skill of an ordinary artisan. Nothing more is required to show a motivation to combine under [*KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007)]....").

Zeilinger and Boireau are analogous art directed to the same field of endeavor as the '103 Patent (*i.e.*, antenna designs). Ex. 1005 at ¶[0002]; Ex. 1004 at ¶[0001]. Like the '103 Patent, Zeilinger and Boireau are directed to the same problem of improving antenna geometry for small devices. Ex. 1005 at ¶[0002]; Ex. 1004 at ¶[0001]. It would have been obvious to combine the teachings of Boireau with those of Johnson because a person of ordinary skill would have found it obvious to use the antennas of Johnson with any of a variety of mobile phones at the time, including those with a touch screen as disclosed by Boireau. Ex. 1002 at ¶160.

One of ordinary skill would find this aspect of the preamble, to the extent it is limiting, disclosed in the teachings of Zeilinger and Boireau and their incorporated disclosures taken as a whole. *Id.* at ¶156.

ii. “a touch screen;”

As set forth above, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones, which were known to

have touch screens. However, to the extent that a touch screen is not explicitly described in Zeilinger, Boireau discloses this claim limitation.

Boireau teaches that “[m]obile computing device 100 may comprise various input/output (I/O) devices. Such as an alphanumeric keyboard, alphanumeric keypad, numeric keys, keys, buttons, switches, rocker switches, multi-directional rocker switches, a microphone, an audio headset, a camera, a touch-sensitive display screen, a stylus, and so forth.” Ex. 1004 at ¶[0021]. Therefore, Boireau discloses a touch screen. *See also* Ex. 1002 at ¶159.

It would have been obvious to combine the teachings of Boireau with those of Zeilinger because a person of ordinary skill would have found it obvious to use the antennas of Zeilinger with any of a variety of mobile phones at the time, including those with a touch screen as disclosed by Boireau. *Id.* at ¶160.

iii. “a processing module;”

As set forth above, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones, which were known to have processors. However, to the extent that a processor is not explicitly described in Zeilinger, Boireau discloses this claim limitation.

Boireau teaches that “[h]ousing 102 may be used to encapsulate various internal components for mobile computing device 100, such as a processor, a

memory, one or more transceivers, one or more printed circuit board (PCB), one or more antennas, a stylus, and so forth.” Ex. 1004 at ¶[0020]. The ’103 Patent defines a “processing module” as a “microprocessor or CPU.” Ex. 1001 at 8:21-22. Therefore, Boireau’s “processor” is a processing module. Ex. 1002 at ¶164.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶165. Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Zeilinger because a person of ordinary skill would have found it obvious to use the antennas of Zeilinger with any of a variety of mobile phones at the time, which included processors as disclosed by Boireau. *Id.* at ¶166.

iv. “a memory module;”

As set forth above, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones, which were known to have memory. However, to the extent that memory is not explicitly described in Zeilinger, Boireau discloses this claim limitation.

Boireau teaches that “[h]ousing 102 may be used to encapsulate various internal components for mobile computing device 100, such as a processor, a

memory, one or more transceivers, one or more printed circuit board (PCB), one or more antennas, a stylus, and so forth.” Ex. 1004 at ¶[0020].

One of ordinary skill would find this limitation disclosed in the teaching of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶170.

Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Zeilinger because a person of ordinary skill would have found it obvious to use the antennas of Zeilinger with any of a variety of mobile phones at the time, which included memory as disclosed by Boireau. *Id.* at ¶172.

v. “a communication module;”

As set forth above, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones, which were known to have antennas for communication. For example, Zeilinger teaches, “[w]ith the advent of digital signal transmission systems used in mobile telephones, other frequency bands are being utilized for communication. These bands are separated and are utilized for different communications application, for example, the go anywhere aspect of the PCS (“Personal Communication Services”) band, the GSM band that is widely used in Europe and other bands. Each of these bands offers certain advantages and it is desirable to utilize mobile telephones that operate

reliably within all such bands. Important to this operation are effective antennas.”

Ex. 1005, ¶[1004].

However, to the extent that memory is not explicitly described in Zeilinger, Boireau discloses this claim limitation. Boireau teaches that “[h]ousing 102 may be used to encapsulate various internal components for mobile computing device 100, such as a processor, a memory, one or more transceivers, one or more printed circuit board (PCB), one or more antennas, a stylus, and so forth.” Ex. 1004 at ¶[0020]. Boireau also teaches a “transceiver module 304 [that] may include multiple transceivers and associated hardware and/or software components implemented in a single integrated package or module, such as on the same die, package or PCB. Transceiver module 304 may be implemented using a single chip, multiple chips, or a system on a chip (SoC) solution, as desired for a given set of performance and design constraints.” *Id.* at ¶[0036]. A POSITA would have understood that the “transceiver module” disclosed in Boireau would meet the limitations of a communication module. Ex. 1002 at ¶176.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger or Boireau and their incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶177.

vi. “a power management module;”

The '103 Patent describes the power management module as the “single source of energy” for the MFWD (wireless device). Ex. 1001 at 8:26-28. Thus, as set forth above, Zeilinger teaches use of its disclosed antennas in connection with wireless devices, including mobile phones, which were known to have energy sources for operation. However, to the extent that memory is not explicitly described in Zeilinger, Boireau discloses this claim limitation. Boireau teaches that “[m]obile computing device 100 also may comprise a rechargeable battery, such as a removable and rechargeable lithium ion battery, and an alternating current (AC) adapter.” Ex. 1004 at ¶[0022]. A battery as disclosed in Boireau would meet the “source of energy” description for a power management module. Ex. 1002 at ¶182.

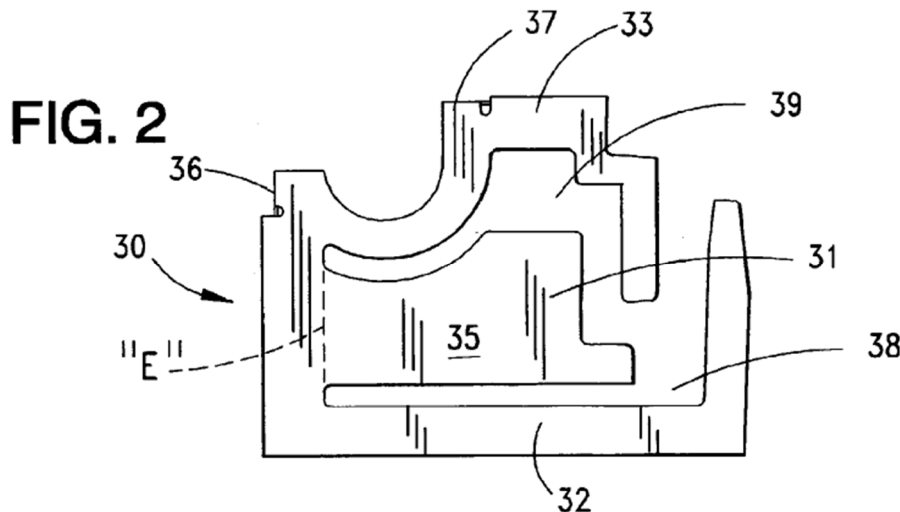
One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶183.

Additionally, for the same reasons as described above, it would have been obvious to combine the teachings of Boireau with those of Zeilinger because a person of ordinary skill would have found it obvious to use the antennas of Zeilinger with any of a variety of mobile phones at the time, which included power management modules (e.g, batteries) as disclosed by Boireau. *Id.* at ¶184.

vii. “an antenna system within the handheld multifunction wireless device and comprising:”

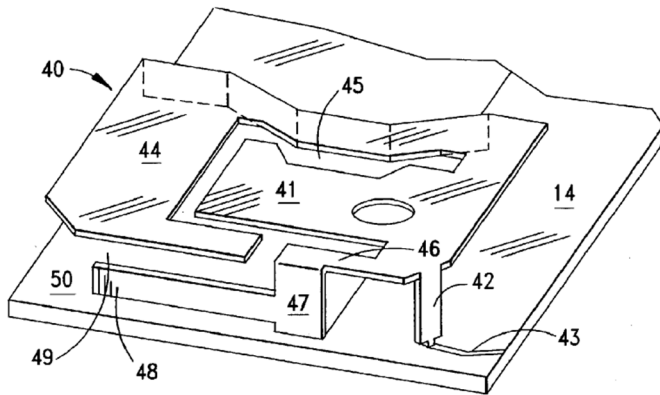
Zeilinger discloses this claim limitation. For example, the following written description discloses an antenna system:

Zeilinger teaches use of its disclosed antennas in connection within wireless devices. For example, “FIG. 1 illustrates a mobile telephone housing 10 which is exemplary of the environment in which antennas of the present invention are used. As is known, the telephone housing 10 is formed from suitable plastic in the form of a hollow shell 11 having an internal cavity 12 surrounded by exterior sidewalls 13a, 13b. One or more printed circuit boards 14, 20 may be provided and supported within the cavity 12. Integrated circuits 15 in the form of chips 16 that power different aspects of the telephone may be supported on the circuit boards 14 and terminated to various circuits thereon.” Ex. 1005 at ¶[0024].



Id. at FIG. 2.

FIG. 3



Id. at FIG. 3.

Boireau discloses this claim limitation. For example, the following figures and accompanying written description disclose an antenna system within the handheld multifunction wireless device:

Boireau teaches that “[m]obile computing device 100 may comprise an antenna system including one or more antennas.” Ex. 1004 at ¶[0025].

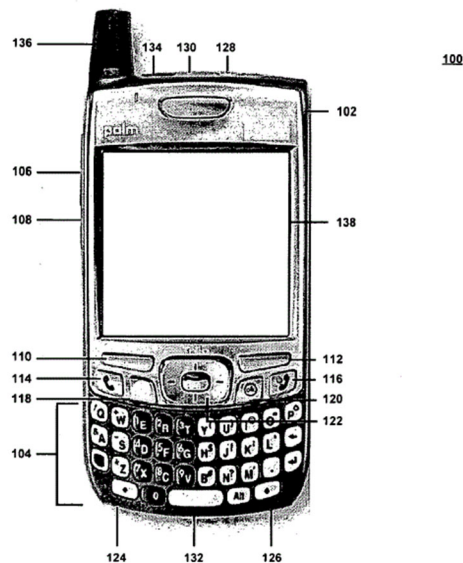


FIG. 1

Id. at FIG. 1.

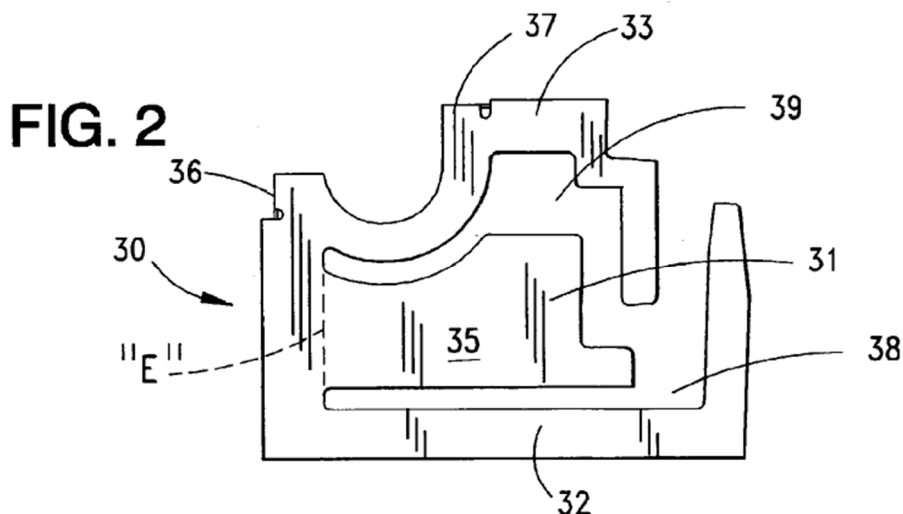
Boireau also teaches “antenna 318 may be implemented alone, or as part of a broader antenna system (e.g., antenna 136) or antenna array for mobile computing device 100.” *Id.* at ¶[0048].

Therefore, Boireau discloses an antenna system within the handheld multifunction wireless device.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger or Boireau and their incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶190.

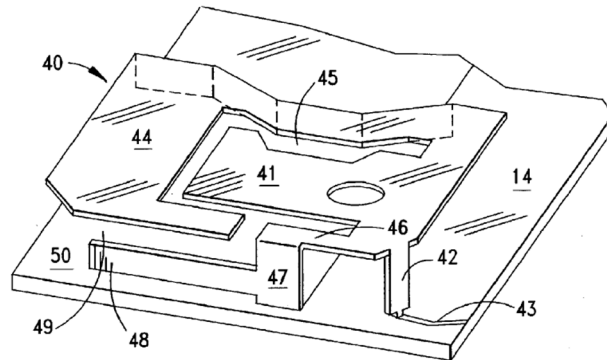
viii. “a ground plane layer;”

Zeilinger discloses this claim limitation. For example, the following written description discloses a ground plane layer:



Ex. 1005 at FIG. 2.

FIG. 3



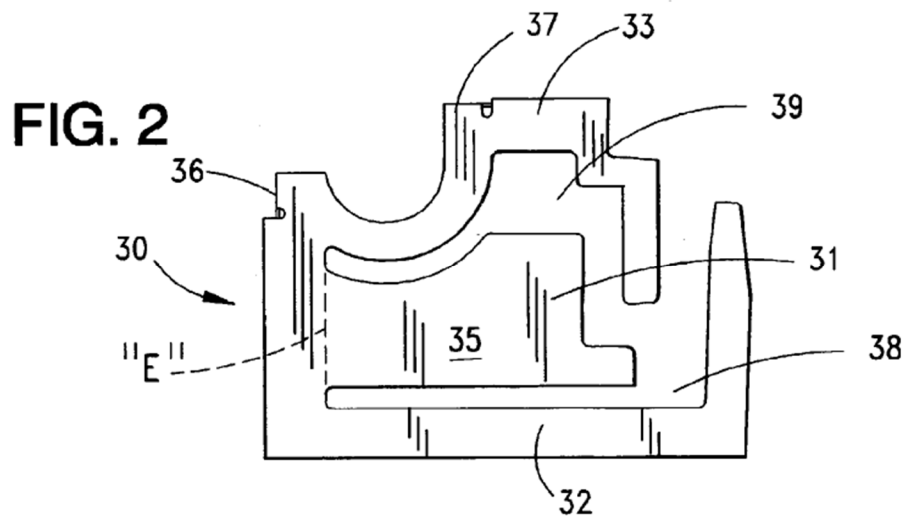
Id. at FIG. 3.

Zeilinger teaches that “[a] second leg portion 37 is provided and it also is angled with respect to the radiating elements 31-33. This leg portion is electronically connected to a ground plane of the telephone 10, which can be a Separate component, or it can be formed on one of the circuit boards 14.” *Id.*, ¶[0028]. Also, “[i]n this instance, the third radiator communicates directly with the ground pin 47 and extends in a direction between the two radiating elements and a ground plane 50 that is either formed on the surface of the circuit board 14 or formed as a layer of the circuit board.” *Id.* at ¶[0033].

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶193.

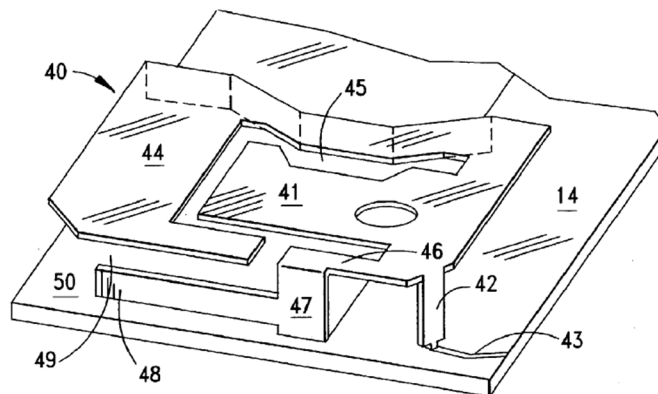
- ix. “a first antenna element configured to simultaneously support radiation modes for first, second, and third frequency bands,”

Zeilinger discloses this claim limitation. For example, the following written description discloses a first antenna element configured to simultaneously support radiation modes for first, second, and third frequency bands:



Ex. 1005 at FIG. 2.

FIG. 3



Id. at FIG. 3.

Zeilinger teaches that “the radiating element 38 drives the PCS frequency band, while the second radiating element 32 drives the GSM900 frequency band. The third radiating element improves the bandwidth of the antenna by driving the PCN frequency band of the antenna.” *Id.* at ¶[0029].

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole. Ex. 1002 at ¶196.

x. “the first frequency band being contained within a first frequency region of an electromagnetic spectrum,”

Zeilinger discloses a “Tri-Band Antenna” and this claim limitation. For example, the following description discloses a first frequency band being contained within a first frequency region of an electromagnetic spectrum, along with other frequency bands. Zeilinger teaches, “FIG. 5 is a VSWR plot of the operation of the antenna 30 of FIG. 2, but without the third radiating element 33 in place. In this instance, as evidenced by the “markers'1-5, it can be seen that two distinct operational frequency bands are defined, with the first band shown to the left of FIG. 5 and extending between markers 1 and 2 at frequencies of 880,000 MHz to 960,000 MHz, thereby covering the GSM900 band. The second operational frequency band in which the antenna operates is defined by markers 3 and 4 and can be seen, at the 6 dB level represented by the dark line D of FIG. 5, to cover the GSM 1800 band, from 1719 MHz to about 1880 MHz. This does not include the

PCS or GSM 1900 MHZ bands.” Ex. 1005 at ¶[0030]. Further, “FIG. 6 illustrates a VSWR plot of the antenna 30 of FIGS. 2 and 4, with the third radiating element 33 in place. Two peaks are shown on the plot and the second peak, “B”, shown to the right of FIG. 6) is wider than the second peak, “B”, to the right of FIG. 5. This is because the third radiating element causes a third peak, or spike close to the second one and the two radiating elements cooperatively combine to form a single, wider peak, or Spike. In FIG. 6, the first peak “A”, as defined by markers 1 and 2 provide an effective bandwidth from 880 to 960 MHZ at 6 dB, while the second peak “B”, as defined by markers 3 and 5, provide an effective bandwidth from 1710 to 1990 MHZ, thereby effectively encompassing both the GSM 1800 and 1900 bands (and the PCS band).” *Id.* at ¶[0031].

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶200.

- xi. “the second frequency band being contained within a second frequency region of the electromagnetic spectrum that is higher in frequency than the first frequency region,”**

As set forth above, in connection with the disclosures cited for the first frequency band, Zeilinger discloses a “Tri-Band Antenna” and this claim limitation. Ex. 1005 at ¶¶[0030]-[0031]. One of ordinary skill would find this

limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶209.

xii. “the third frequency band of operation being used by a 4 G communication standard,”

As set forth above, in connection with the disclosures cited for the first frequency band, Zeilinger discloses a “Tri-Band Antenna” and this claim limitation. Ex. 1005 at ¶¶[0030]-[0031]. Additionally, Zeilinger discloses, “It is therefore a general object of the present invention to provide a low cost multiple band antenna having a small form factor and which is capable of operating in three distinct frequency bands so as to operate in GSM900 frequency band (from 880 to 960 Megahertz), the GSM1800 frequency band (from 1710-1889 Megahertz) and the PCT GSM 1900 frequency band (also referred to as the UMTS Band extending from 1900 to 2170 Megahertz).” *Id.*, ¶[0008].

The '103 patent itself includes “3G and other advanced services for instance HSDPA, WiBro, WiFi, WiMax, UWB or other high speed wireless standards,” as among those referred to by the '103 patent as “4G services” and “might require operation in additional frequency bands corresponding to said 4G standards (for instance, bands within the frequency region 2-11 GHz and some of its sub-regions such as for instance 2-11 GHz, 3-10 GHz, 2.4-2.5 GHz and 5-6 GHz or

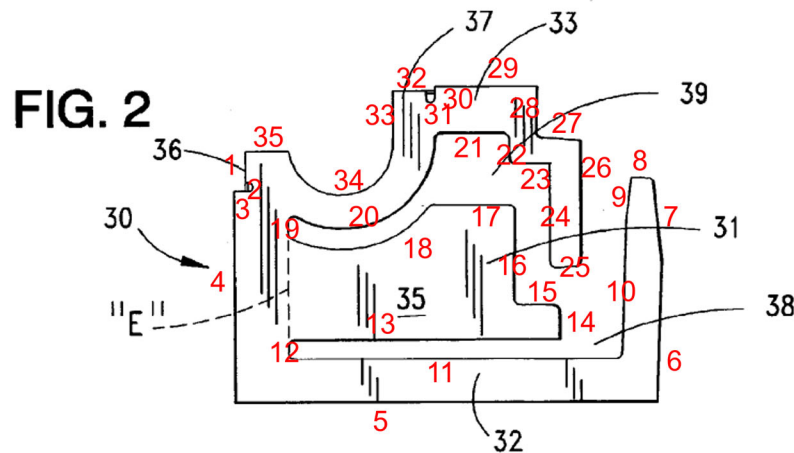
some other bands).” Ex. 1001, 24:22-30.⁴ Certainly, the antennas taught by Zeilinger are configured to transmit and receive such high speed signals within the broad scope of “4G” provided in the ’103 patent. *Id.* at 24:22-30.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶209.

xiii. “wherein a perimeter of the first antenna element defines a first antenna contour comprising at least thirty-five segments,”

Zeilinger discloses this claim limitation. For example, the following figures and accompanying written description discloses a perimeter of the first antenna element defines a first antenna contour comprising at least thirty-five segments:

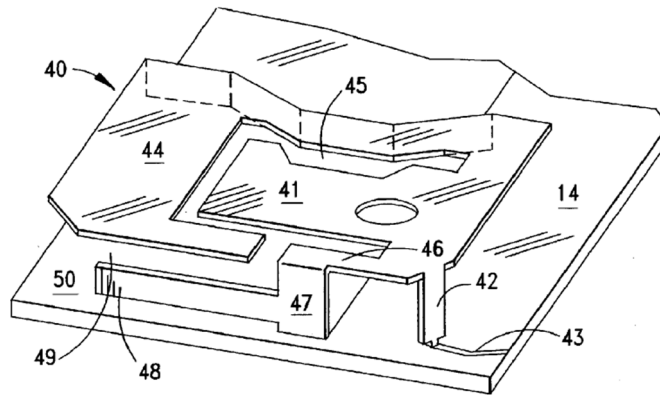
⁴ As explained by Dr. Tentzeris, this definition by the ’103 Patent is at odds with the traditional applications of the “4G” moniker which does not include, for example, 3G or WiFi. Ex. 1002, ¶207. However, “the inventor’s lexicography governs” if the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess.” *Phillips v. AWH Corp.*, 415 F.3d 13016 (Fed. Cir. 2005). That is not to say that the description in the ’103 patent for “4G” is reasonably certain, and, in the Litigation, Petitioner asserts that “4G communication standard” would not have a reasonably certain meaning at the time of the invention and is therefore indefinite.



Ex. 1005 at FIG. 2 (annotated).

The '103 Patent discloses that “[a]long the contour different segments can be identified e.g. by a corner between two segments, wherein the corner is given by a point on the contour where no unique tangent can be identified. At the corners the contour has an angle. The segments next to a corner may be straight or curved or one straight and the other curved. Further, segments may be separated by a point where the curvature changes from left to right or from right to left. In a sine curve, for example such points are given where the curve intersects the horizontal axis (x-axis, abscissa, $\sin(x)=0$).” Ex. 1001 at 15:4-13. Based on this definition, the first antenna contour as shown above in FIG. 2 has at least 35 segments. Ex. 1002 at ¶212. The contour shown in Figure 3 has even more segments.

FIG. 3

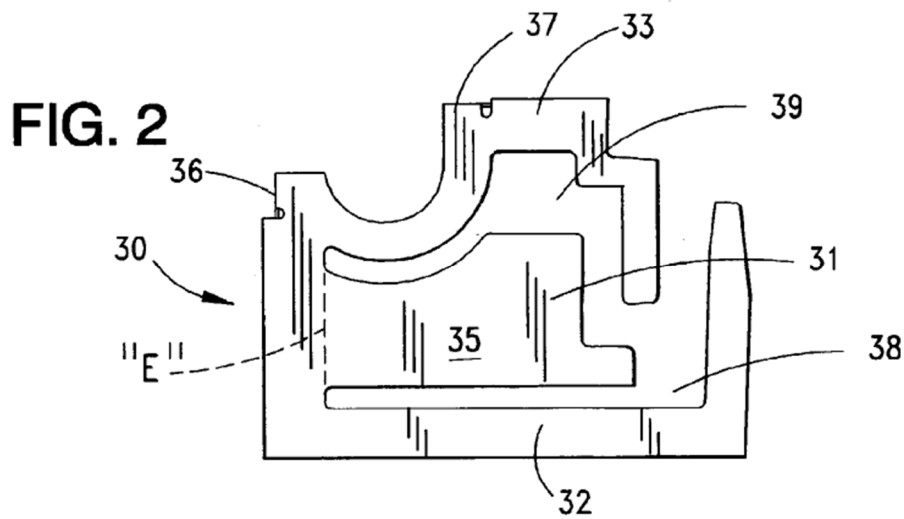


Ex. 1005 at FIG. 3.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole. Ex. 1002 at ¶213.

- xiv. **“the first antenna element defining an antenna box, an orthogonal projection of the antenna box along a normal to a face with a largest area of the antenna box defining an antenna rectangle,”**

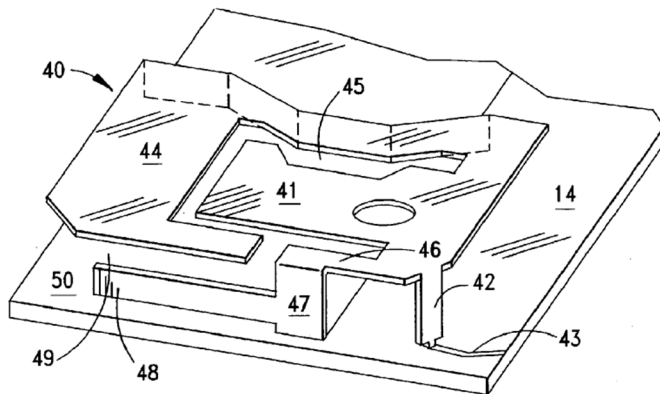
Zeilinger discloses this claim limitation. For example, the following written description discloses a first antenna element defining an antenna box, an orthogonal projection of the antenna box along a normal to a face with a largest area of the antenna box defining an antenna rectangle:



Ex. 1005 at FIG. 2. The Figure 2 shows a plan view of the antenna that by definition forms planar antenna defining an attend box and an antenna rectangle.

Ex. 1002 at ¶215. The antenna rectangle being an orthogonal projection of the antenna box along a normal to a face with a largest area. *Id.*

FIG. 3

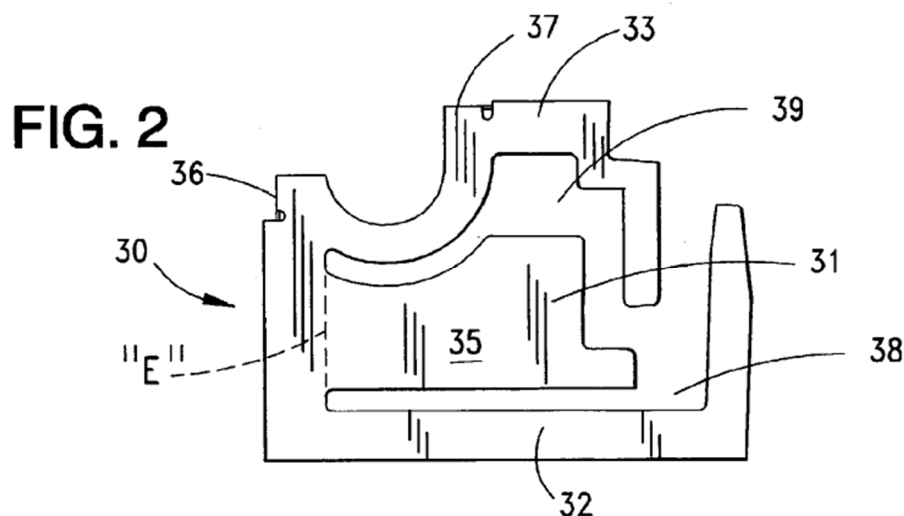


Ex. 1005 at FIG. 3. Similarly, Figure 3 shows a perspective view for which the top face is the largest area and defines an antenna box and antenna rectangle. Ex. 1002 at ¶216.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶217.

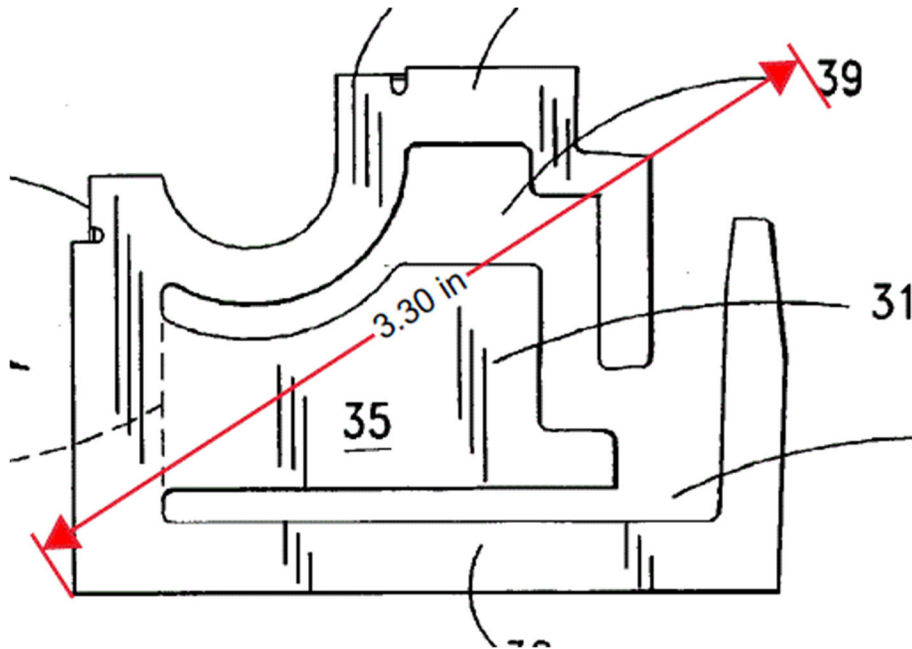
xv. “wherein a length of the first antenna contour is greater than four times a diagonal of the antenna rectangle; and”

Zeilinger discloses this claim limitation. For example, the following figures and accompanying written description discloses a length of the first antenna contour is greater than four times a diagonal of the antenna rectangle:

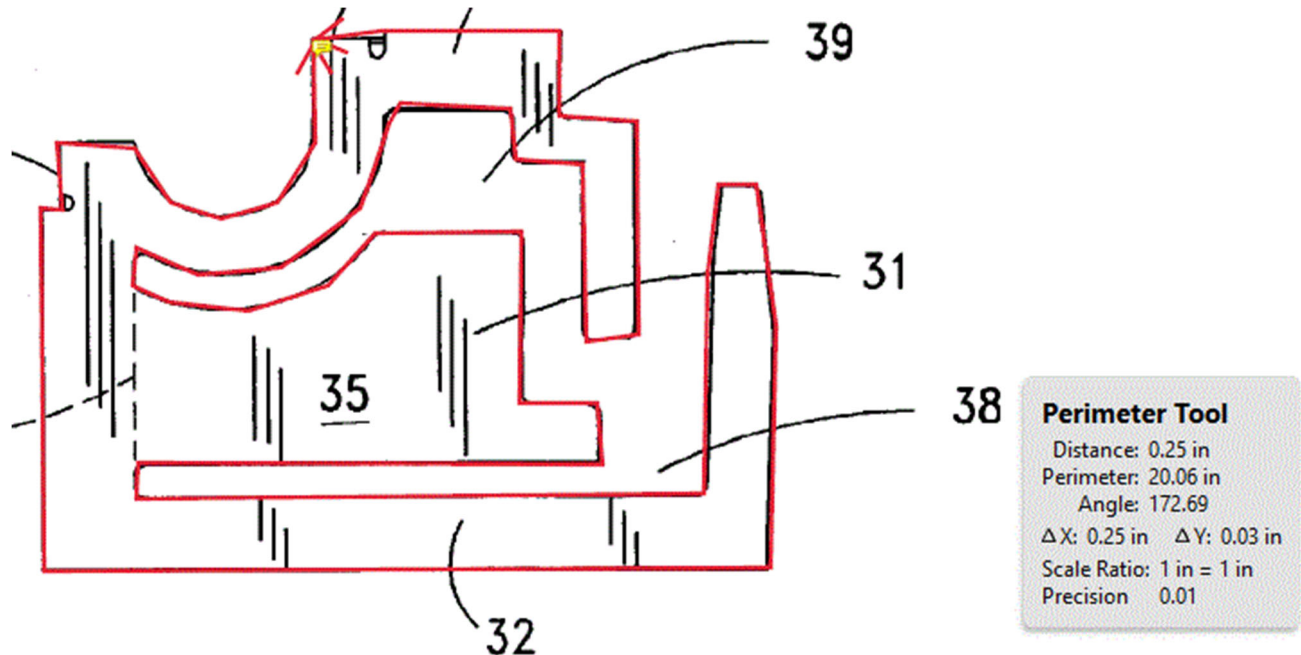


Ex. 1005 at FIG. 2.

Measuring the lengths of the segments reveals that it is greater than 4X the diagonal of the antenna rectangle. Ex. 1002 at ¶¶219-220.



The diagonal of the antenna rectangle of FIG. 2. is approximately 3.30 units of length such that four times the diagonal is 13.2 units of length. *Id.* at ¶221.



The length of the contour of FIG. 2 is approximately 20 units of length using the same scale to measure the diagonal, which is more than four times the diagonal (13.2). *Id.* at ¶222.

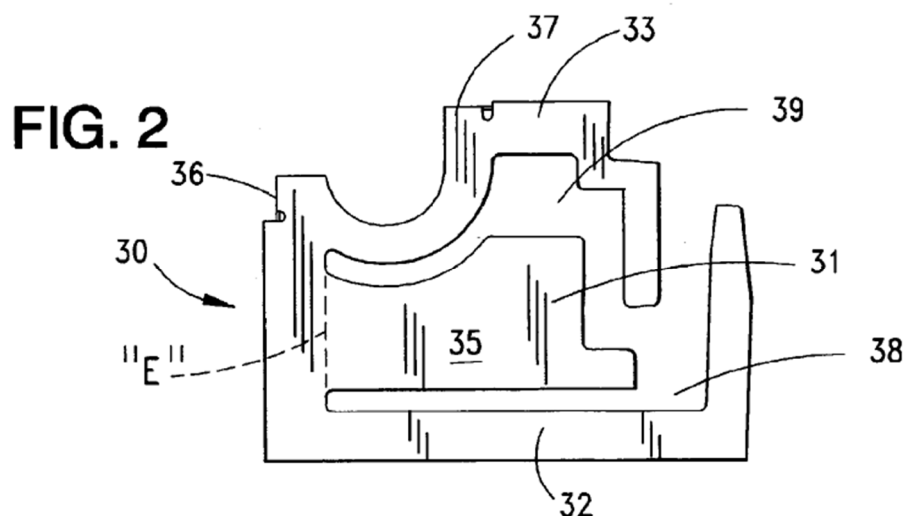
Similarly, assuming a similarly sized antenna rectangle and corresponding diagonal length for the contour in Figure 3, the length of the contour in figure 3 is almost certainly longer than that of Figure 2 and thus exceeds four times the diagonal as well. *Id.* at ¶223.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole. *Id.* at ¶224.

- xvi. “a second antenna element configured to operate in at least one frequency band used by a 4 G communication standard, wherein a perimeter of the second antenna

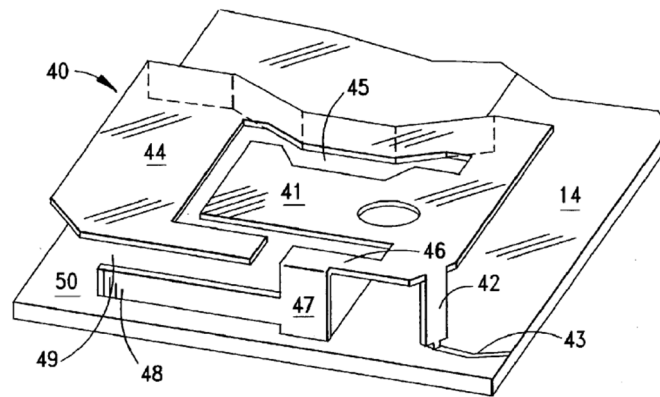
element defines a second antenna contour comprising at least twenty segments.”

Zeilinger teaches use of its disclosed antennas in connection within wireless devices. For example, “FIG. 1 illustrates a mobile telephone housing 10 which is exemplary of the environment in which antennas of the present invention are used. As is known, the telephone housing 10 is formed from suitable plastic in the form of a hollow shell 11 having an internal cavity 12 surrounded by exterior sidewalls 13a, 13b. One or more printed circuit boards 14, 20 may be provided and supported within the cavity 12. Integrated circuits 15 in the form of chips 16 that power different aspects of the telephone may be supported on the circuit boards 14 and terminated to various circuits thereon.” Ex. 1005 at ¶[0024]. And Zeilinger discloses at least two antennas with contours of at least 20 segments and that operate in the disclosed frequency bands.



Id. at FIG. 2.

FIG. 3



Id. at FIG. 3.

However, to the extent that a second antenna element is not explicitly described in Zeilinger, Boireau discloses this claim limitation. For example, the following figures and accompanying written description disclose an antenna system within the handheld multifunction wireless device:

Boireau teaches that “[m]obile computing device 100 may comprise an antenna system including one or more antennas.” Ex. 1004 at ¶[0025].

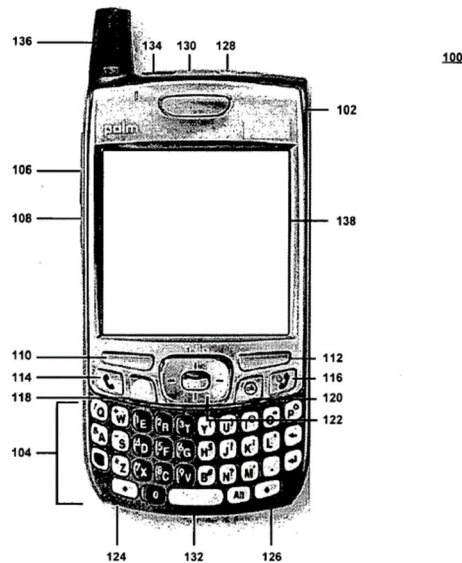


FIG. 1

Id. at FIG. 1.

Boireau also teaches “antenna 318 may be implemented alone, or as part of a broader antenna system (e.g., antenna 136) or antenna array for mobile computing device 100.” *Id.* at ¶[0048].

Therefore, one of ordinary skill in the art would have found it obvious to implement the antennas of Zeilinger alone, or as part of a broader antenna system or array for the mobile computing devices of Boireau. Accordingly, one of ordinary skill would find this limitation disclosed in the teachings of Zeilinger or Boireau and their incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. Ex. 1002 at ¶¶230-231.

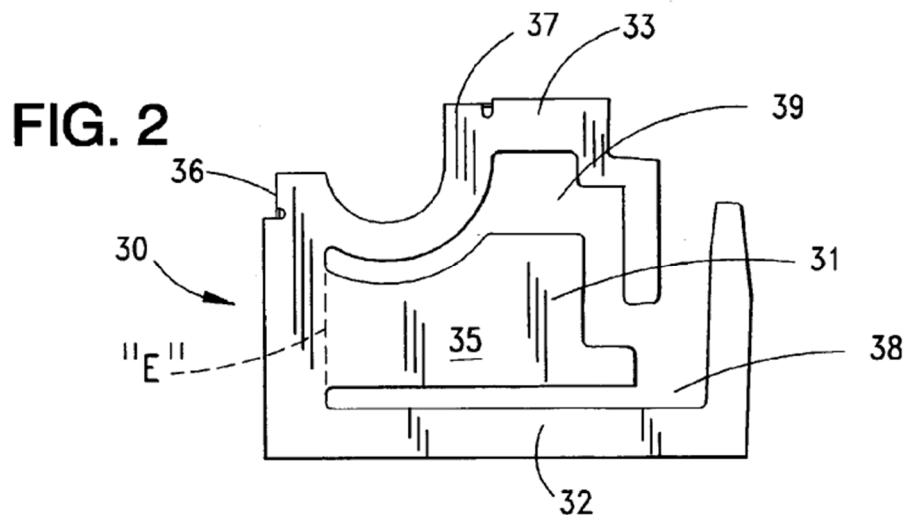
2. Claim 15

- i. “The handheld multifunction wireless device according to claim 12,”**

See claim 12 above.

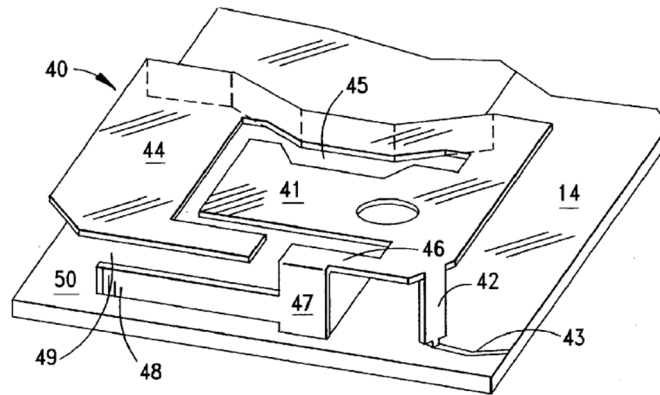
- ii. “wherein the ground plane layer defines a ground plane rectangle, the projection of the antenna rectangle on the ground plane rectangle partially overlapping the ground plane rectangle.”**

Zeilinger discloses this claim limitation. For example, the following figures and accompanying written description discloses a ground plane layer defines a ground plane rectangle, the projection of the antenna rectangle on the ground plane rectangle partially overlapping the ground plane rectangle:



Ex. 1005 at FIG. 2.

FIG. 3



Id. at FIG. 3.

Zeilinger teaches that “[a] second leg portion 37 is provided and it also is angled with respect to the radiating elements 31-33. This leg portion is electronically connected to a ground plane of the telephone 10, which can be a separate component, or it can be formed on one of the circuit boards 14.” *Id.*, ¶¶[0028]. Also, “[i]n this instance, the third radiator communicates directly with the ground pin 47 and extends in a direction between the two radiating elements and a ground plane 50 that is either formed on the surface of the circuit board 14 or formed as a layer of the circuit board.” *Id.* at ¶¶[0033].

According to the '103 patent, “a ground plane rectangle is defined as being the minimum-sized rectangle that encompasses the ground plane of the antenna system....” Ex. 1001, 14:4-6. Accordingly, Figures 2-3 show an antenna with an

antenna rectangle that when projected on the ground plane at least partially overlaps the ground plane rectangle. Ex. 1002 at ¶235.

One of ordinary skill would find this limitation disclosed in the teachings of Zeilinger and its incorporated disclosures taken as a whole, or in combination with the state of the art at the time of the alleged invention. *Id.* at ¶236.

X. NO BASIS TO DENY PETITION UNDER 35 U.S.C. §§325(D), 314(A), OR 324(A)

As established above, the merits of the Petition are compelling, and the Board should institute trial. The facts do not support the Board exercising its discretion to deny institution.

A. Denial under §325(d) is Inappropriate

As established below, the Board should not exercise discretion to deny institution under §325(d).

1. Denial under *Advanced Bionics* is inappropriate

In applying §325(d), “the Board uses the following two-part framework: (1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.” *Advanced Bionics, LLC v. Med-*

El Elektromedizinische Geräte GMBH, IPR2019-01469, Paper 6, 8 (PTAB Feb. 13, 2020) (precedential).

Prongs 1 and 2 are evaluated by analyzing the Factors set forth in *Becton, Dickinson and Company v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, 17–18 (PTAB Dec. 15, 2017) (informative, precedential as to Section III.C.5, first para.). Factors A, B, and D are typically handled under Prong 1, while Factors C, E, and F are typically handled under Prong 2.

First, while one prior art reference relied on for Ground 1, Johnson, was cited in among the hundreds of potential prior art references in dozens of information disclosure statements, Johnson was not cited in an office action against any of the Challenged Claims. The second prior art reference relied on for Ground 1, Boireau, was not cited at all during the prosecution of the '103 Patent. Further, none of the prior art references relied on during prosecution for rejecting the Challenged Claims were substantially similar to Johnson or Boireau.

Second, Boireau nor Zeilinger, the prior art relied on for Ground 2, were not cited at all during the prosecution of the '103 Patent. Further, none of the prior art references relied on during prosecution for rejecting the Challenged Claims were substantially similar to Zeilinger or Boireau.

i. Conclusion

The *Becton Dickinson* factors do not support denial of this Petition under 35

U.S.C. §325(d). *Becton*, Paper 8, 17–18. Unlike in *NHK Spring Co. v. Intrix-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sept. 12, 2018) (precedential), the issues presented in the Petition are not duplicative of those considered during prosecution.

2. Denial under *Fintiv* is inappropriate

Denial under *Fintiv* is also inappropriate. *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”).

**i. whether the court granted a stay or evidence exists
that one may be granted if a proceeding is instituted;**

Petitioner intends to move the court to stay the Litigation after filing this Petition. Petitioner has filed IPR petitions against each unexpired asserted claim in the Litigation such that, based on the grounds for invalidity asserted herein, there will be no asserted claim for which a stay would prejudice the Patent Owner in any way if the case were stayed. The stage of the Litigation and potential simplification (resulting from the Board invalidating claims) weighs against the exercise of discretion. At worst, this factor is neutral because the Board “will not attempt to predict” how the district court will proceed. *Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24, 7 (PTAB Jun. 16, 2020).

ii. proximity of the court’s trial date to the Board’s

**projected statutory deadline for a final written
decision;**

While the Court has initially set the trial date in the Litigation for July 8, 2024, trial dates are notoriously unreliable and should be an insufficient basis upon which to deny institution. “A court’s general ability to set a fast-paced schedule is not particularly relevant.” *In re Apple Inc.*, No 20-135, slip op. at 16 (Fed. Cir. Nov. 9, 2020); *DISH Network L.L.C. v. Broadband iTV, Inc.*, IPR2020-01280, Paper 17 at 13-16 (PTAB Feb. 4, 2021). The Federal Circuit found error in the Board’s reliance on the case’s scheduled trial date. *In re Apple Inc.*, No 20-135, slip op. at 15. It would be error for the Board to speculatively rely upon the current schedule. The Board has repeatedly been persuaded by the uncertainty in litigation timelines. *Sand Revolution*, Paper 24 at 8-9; *see also* IPR2021-00255, Paper 22 at 11-12 (PTAB Aug. 23, 2021). These same uncertainties are present here.

**iii. investment in the parallel proceeding by the court and
the parties;**

Investment in the Litigation is not significant. No depositions have been taken, claim construction has not occurred, and discovery is in its early phases. Thus, this factor weighs in favor of institution. *See, e.g., Nokia of America Corp and Ericsson Inc. v. IPCOM, GMBH & Co. KG*, IPR2021-00533, Paper 10 at (PTAB Aug. 12, 2021) (“If, at the time of institution, the district court has not issued substantive

orders related to the patent at issue in the petition, this fact weighs against exercising discretion to deny institution.”).

iv. overlap between issues raised in the petition and in the parallel proceeding;

The issues raised in this petition are among those raised in the Litigation. This factor, however, should be neutral weighed insofar as, the Plaintiff will almost certainly narrow the asserted claims, from the almost 45 asserted claims across six asserted patents.

v. whether the petitioner and the defendant in the parallel proceeding are the same party;

The Petitioner here and the defendant in the Litigation are the same.

vi. other circumstances that impact the Board’s exercise of discretion, including the merits.

As shown above, the merits are strong such that this factor weighs heavily against discretionary denial.

B. Denial under §314(A) is Inappropriate

As established above, Petitioner has set forth strong Grounds that overwhelmingly establish that the Challenged Claims are not patentable.

The Board has authority to determine whether to institute an IPR. *See Apple Inc. v. Telefonaktiebolaget LM Ericsson*, IPR2022-00337, Paper 7, 2 (PTAB Sep. 7,

2022). Based on the compelling merits, denial of the Petition under 35 U.S.C. §314(a) is inappropriate. Moreover, Petitioner's use of alternatives with respect to Grounds 1 and 2 is proper and consistent with the interests of efficiency. *See Adaptics Ltd. v. Perfect Co.*, IPR2018-01596, Paper 20, 15, 24 (PTAB Mar. 6, 2019) (informative) (finding that a petition which was alleged to present hundreds of combinations lacked particularity); *Infineon Techs. AG v. Feinics Amatech Teoranta*, IPR2022-00235, Paper 13, 6, 20 (PTAB June 13, 2022) (instituting on alternative grounds).

C. Discretionary Denial is Inappropriate

Discretionary denial is inappropriate and the Board should institute trial.

XI. CONCLUSION

Petitioner respectfully requests that *Inter Partes* review be instituted and that Claims 12 and 15 of the '103 Patent be canceled.

Respectfully submitted,

Dated: October 24, 2023

By: / Jared J. Braithwaite/

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Certificate Under 37 C.F.R. §42.24(d)

The undersigned certifies that the foregoing Petition for *Inter Partes* Review, excluding any table of contents, mandatory notices under 37 C.F.R. §42.8, certificates of service or word count, or appendix of exhibits, contains 12,709 words according to the word-processing program used to prepare this document (Microsoft Word), which is less than the 14,000 allowed under 37 C.F.R. §42.24(a)(1)(i).

By: / Jared J. Braithwaite /

Jared J. Braithwaite
Reg. No. 63,308
Counsel for Petitioner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Petition for *Inter Partes* Review together with all exhibits and other papers filed therewith was served on Patent Owner, by USPS Express Mail or an equivalent next-day delivery service, directed to the attorneys of record for the patent at the following address:

EDELL, SHAPIRO & FINNAN, LLC
9801 Washingtonian Blvd.
Suite 750
Gaithersburg, MD 20878

And by electronic file transfer to litigation counsel for Patent Owner in the Parallel Litigation.

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atisdall@susmangodfrey.com
jnelson@susmangodfrey.com

Dated: October 24, 2023

By: / Jared J. Braithwaite /

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