

Samsung Electronics Co. LTD v. WiPQTUS, Inc.

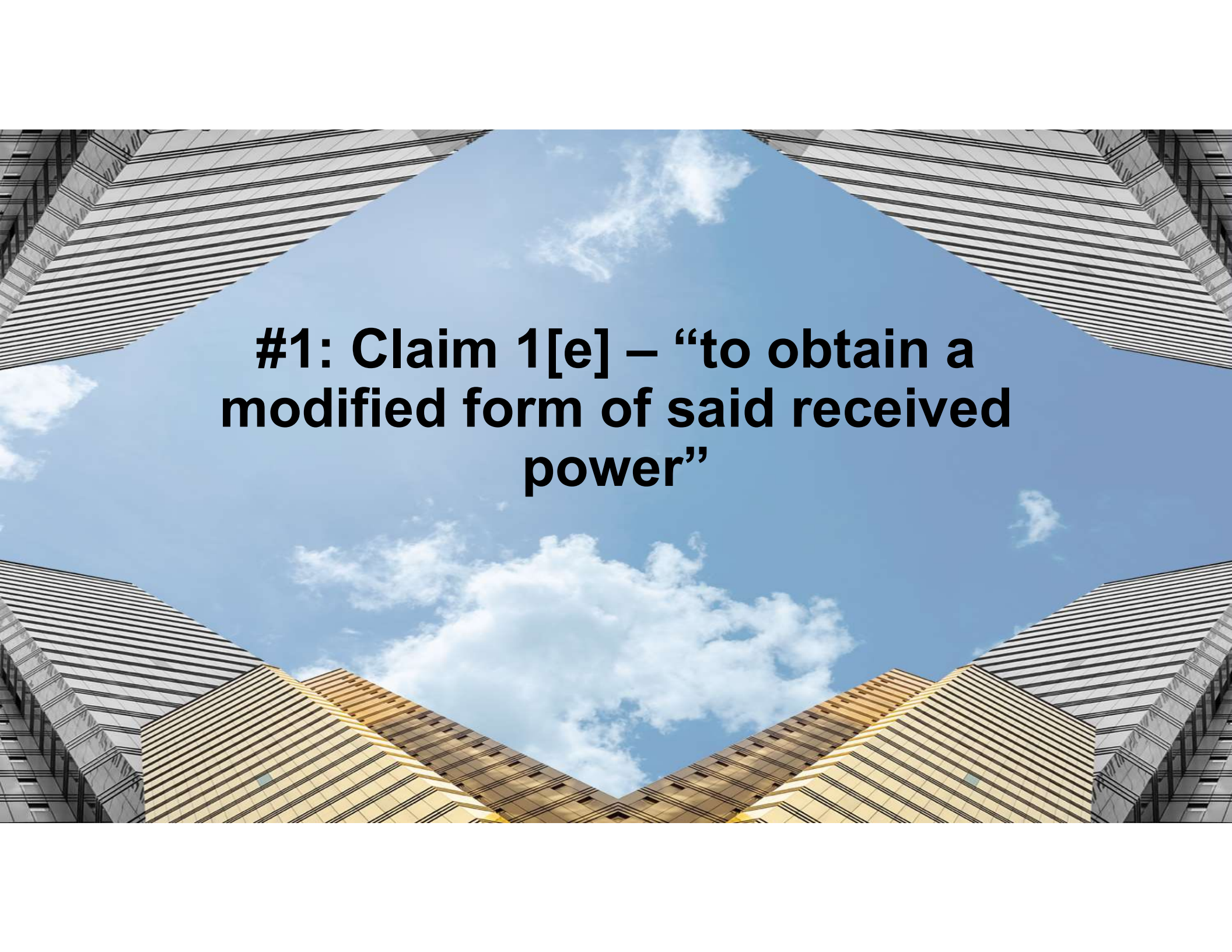
IPR2024-00023: Petitioner's Demonstratives

JANUARY 10, 2025

Demonstrative – Not Evidence

Petitioner's Roadmap: 5 Topics

- 1. Claim 1[e] – “to obtain a modified form of said received power”**
- 2. Construction “One of [A] or [B]”**
- 3. Construction of “Impedance Network”**
- 4. Petition Ground 1: “Impedance Network”**
- 5. Revised Motion to Amend**

A low-angle, upward-looking perspective of several modern skyscrapers. The buildings are constructed from glass and steel, with their facades reflecting the sky. They converge towards the top of the frame, creating a strong sense of height and scale. The sky is a clear, vibrant blue, dotted with soft, white cumulus clouds. The overall composition is symmetrical and dynamic, emphasizing the architectural grandeur of the structures.

#1: Claim 1[e] – “to obtain a modified form of said received power”

'339 Patent: Claim 1

'339 Patent, claim 1.

1. A dual mode wireless power receiver configured to selectively apply a received power to a load device and utilize at least a part of the stored power to power-up a secondary wireless power receiver and communicate with said secondary wireless power receiver to cause an action or transaction or charge said secondary wireless power receiver's load device, said dual mode wireless power receiver comprising:

one of coil and capacitor electrodes;

a first circuitry comprising:

an impedance network;

a switch network;

a filter capacitor;

a second circuitry comprising:

a control logic circuit; and

a modulator/demodulator circuit;

'339 Patent: Claim 1

[Claim 1, continued:]

'339 Patent, claim 1.

said first circuitry configured to receive said power from a wireless power transmitter;

said first circuitry, based on an input from said control logic circuit, **configured to change impedance of said impedance network and topology of said switch network to obtain a modified form of said received power**, and apply said modified form of said power to said load device;

said first circuitry, based on an input from said control logic circuit, configured to change said topology of said switch network and said impedance of said impedance network to transmit at least part of said stored power to said secondary wireless power receiver to power-up said secondary wireless power receiver;

said second circuitry, on power-up of said secondary wireless power receiver, configured to identify a type of said secondary wireless power receiver and identify a wireless power protocol of said secondary wireless power receiver;

said second circuitry, configured to receive and interpret data from said secondary wireless power receiver in said identified wireless power protocol;

said second circuitry, based on said interpretation, configured to perform a function associated with said transmitted power in conjunction with said first circuitry.

Claim [1.e] Does Not Require Modification of the Impedance Network *While Receiving Power*

- Patent Owner argues that claim [1.e] “requires that the impedance of the impedance network be capable of being changed during the mode wherein the dual mode wireless power receiver is receiving power.” POR, 42.
- Yet, claim [1.e] merely requires the “first circuitry” to be “configured to change impedance” to “**obtain a modified form of said received power.**” Reply, 9.
- **“Limitation 1.e does not require an ability to change the impedance of the impedance network during the receiving power mode (charging mode).”** DI, 30.
- The claim does not require realtime modification of the impedance of the impedance network while in the receiving power mode, but merely that a change of impedance enable the first circuitry to “*obtain a modified form of said received power.*” Reply, 9-10.

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings are arranged in a circular pattern, creating a funnel-like effect that draws the eye towards the center. The sky is a vibrant blue, filled with soft, white, fluffy clouds. The buildings have a mix of grey and gold-colored facades, with many windows visible. The perspective creates a sense of height and architectural grandeur.

#2: Construction “One of [A] or [B]”

“One of [A] or [B]”: '339 Patent, Claim 1 v. Claim 3

- Claim [1.b] recites “one of coil and capacitor electrodes.” Patent Owner argues that this should be construed as requiring **either [A] a coil or [B] capacitor electrodes**. Reply, 3 (citing POR, 33).
- Claim 3 recites “the dual mode wireless power receiver of claim 1, wherein said impedance network of said first circuitry comprising of elements that are **one of chosen a priori with fixed values and tuned during operation over a range of values.**”
- Patent Owner argues that the “one of” phraseology in claim 3 should be construed as **requiring both [A] and [B]**. POR, 43.

“One of [A] or [B]”

- Patent Owner argues that claim 3 should be construed differently than claim 1, but the term “impedance network” cannot be construed narrowly for independent claim 1 (requiring components tunable during operation) and more broadly for dependent claim 3 (requiring only a fixed value passive component). Reply, 6.
- The Board correctly determined that “**claim 3 means either [A] ‘chosen a priori with fixed values’ or [B] ‘tuned during operation over a range of values.’**” DI, 32.
- “Thus, we disagree with Patent Owner that claim 3 requires that ‘the component parts of the ‘impedance network’ that have values’ be ‘chosen ‘a priori,’ and the components must be ‘tunable during operation.’” DI, 32.

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings are constructed with a grid-like facade of windows and structural elements. The perspective creates a sense of height and scale, with the buildings converging towards the top of the frame. The sky is a clear, vibrant blue, dotted with soft, white cumulus clouds. The overall composition is symmetrical and geometric, emphasizing the architectural lines of the urban environment.

#3: Construction of “Impedance Network”

Patent Owner's Varying Constructions for “Impedance Network”

- **Patent Owner Response Construction:** “a collection of two or more electrical components chosen from the list (1) one or more passive components; (2) active components; and (3) switches.” Patent Owner Response, 36.
- **Sur-Reply Brief Construction:** “a collection of two or more electrical components, one of which must be a passive component and one of which must be either an active component or switch.” Sur-Reply, 25.

Dr. Direen's Testimony Regarding an "Impedance Network"

- Dr. Direen testified that the "impedance network" of claim [1.e] can be met by a (1) passive component, such as a resistor or a capacitor, and (2) a switch:
 - Q. So is it your understanding **that impedance network 101 could be implemented with as little as a resistor and an electronic switch?**
 - A. **Yes**. Reply, 12 (citing Ex. 1019, 74:24-75:2).
- Dr. Direen also testified that the following would constitute the claimed "impedance network": "[i]t would have to be potentially **a capacitor that's connected to a switch and a priori you close that switch to make that capacitance fixed during the operation of received**. You could afterwards if you go into transmit mode, you could pull that capacitor out completely by unswitching the switch and then you would a priori fix that impedance." Reply, 12 (citing Ex. 1019, 92:14-93:9).

A low-angle, upward-looking photograph of several modern skyscrapers. The buildings are arranged in a circular pattern, creating a funnel-like effect that draws the eye towards the center. The sky is a vibrant blue, filled with soft, white, fluffy clouds. The buildings have a metallic, ribbed texture, with some sections reflecting a golden-yellow light, possibly from the sun being high in the sky.

#4: Petition Ground 1: “Impedance Network”

Proposed Combination in Petition Ground 1 Teaches the “Impedance Network”

- Petition explains: Chatterjee’s “processor 413 sends control signals G1 and G2 to turn off the H-bridge branch 611, and signals G3-G6 to operate the shared branch 612 and sync bridge branch 613, such that the capacitor C2 is not used as part of the circuitry, as shown below in the yellow-highlighted circuitry.” Pet., 40.

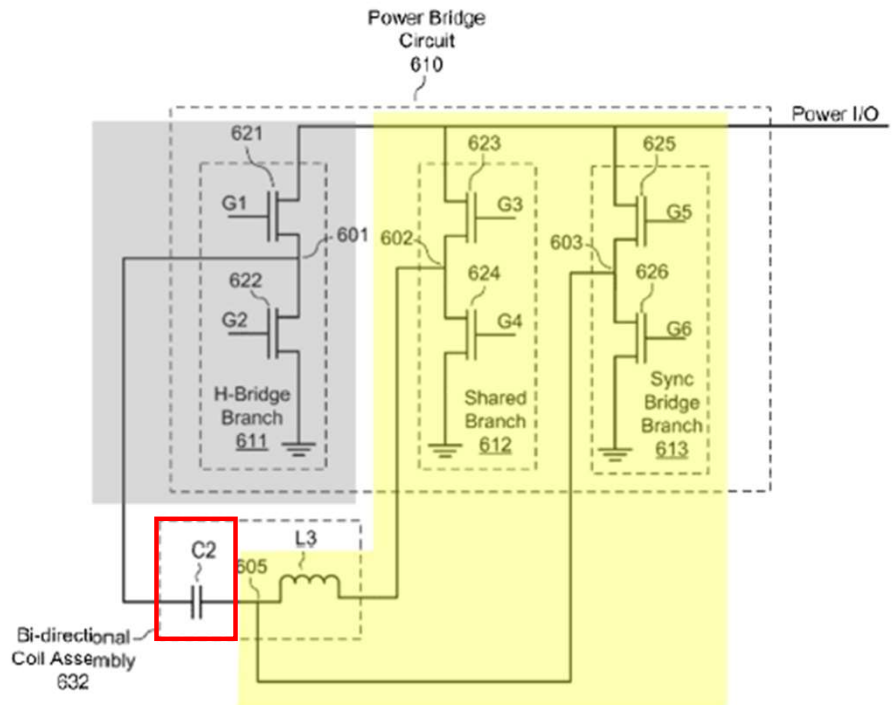


FIG. 6B

Proposed Combination in Petition Ground 1 Teaches the “Impedance Network”

- Petition explains: “capacitor C2 . . . provides different impedance under different modes: in the power transmit mode, the impedance network provides capacitive reactance ($Z_1 = -1/j\omega C$); and in the power receive mode, it does not ($Z_1 = 0$).” Pet., 41-42.

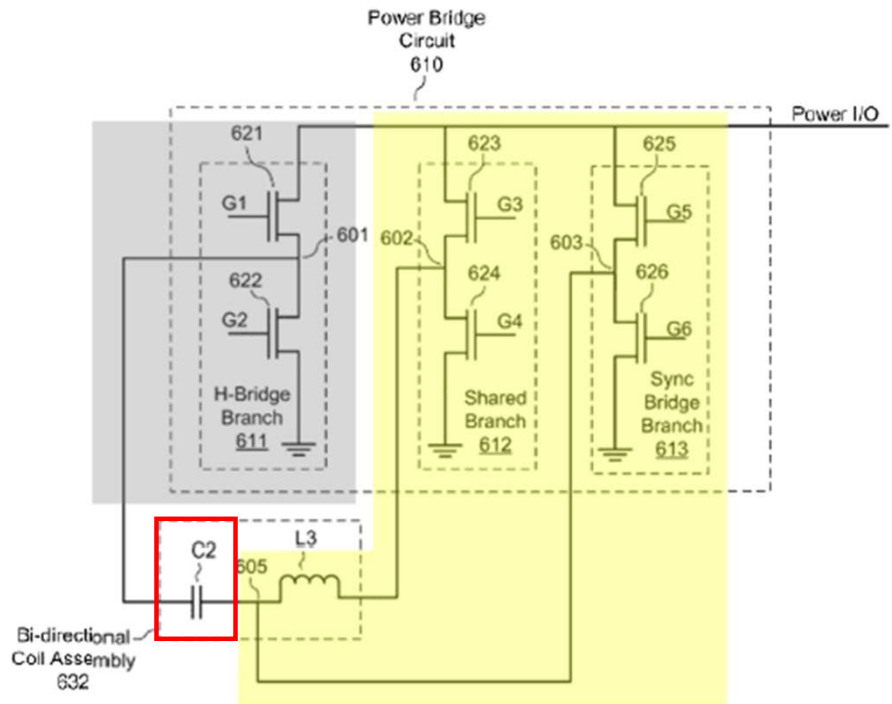


FIG. 6B

'339 Patent, Fig. 10C illustrates single capacitor impedance network 101

- Dr. Direen agreed that the impedance network 101 in Fig. 10C comprised of a single capacitor, C_p , constitutes the claimed “impedance network.” Reply, 17.

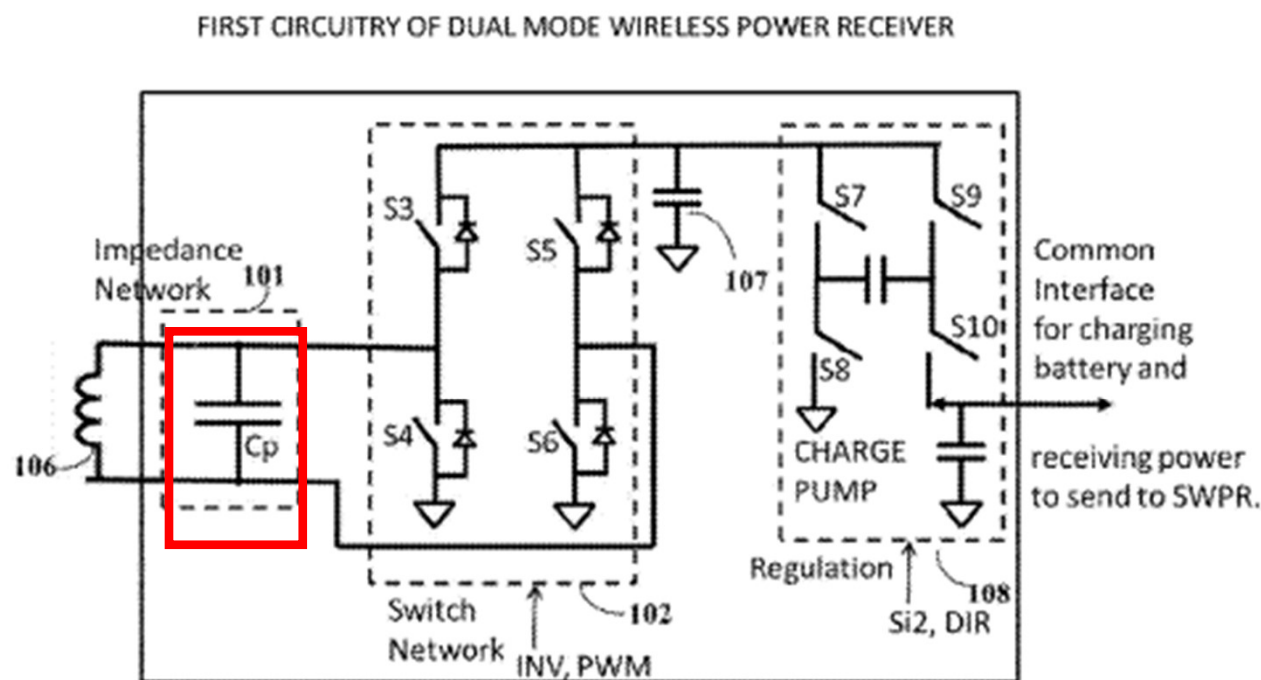
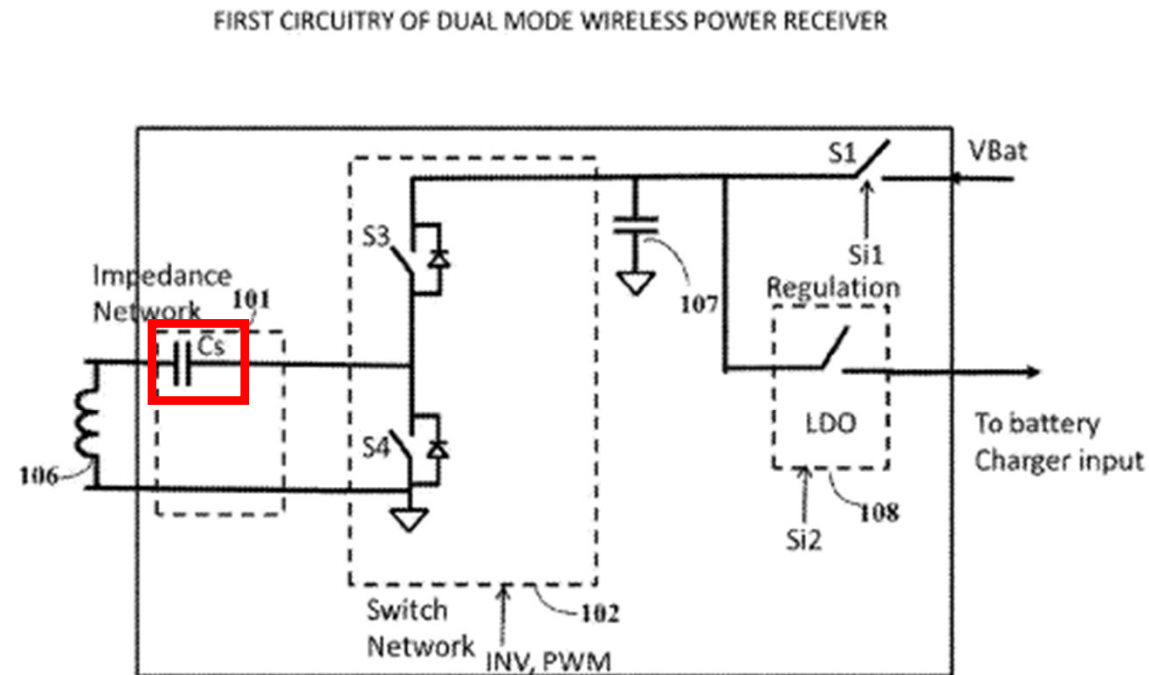


FIG. 10C

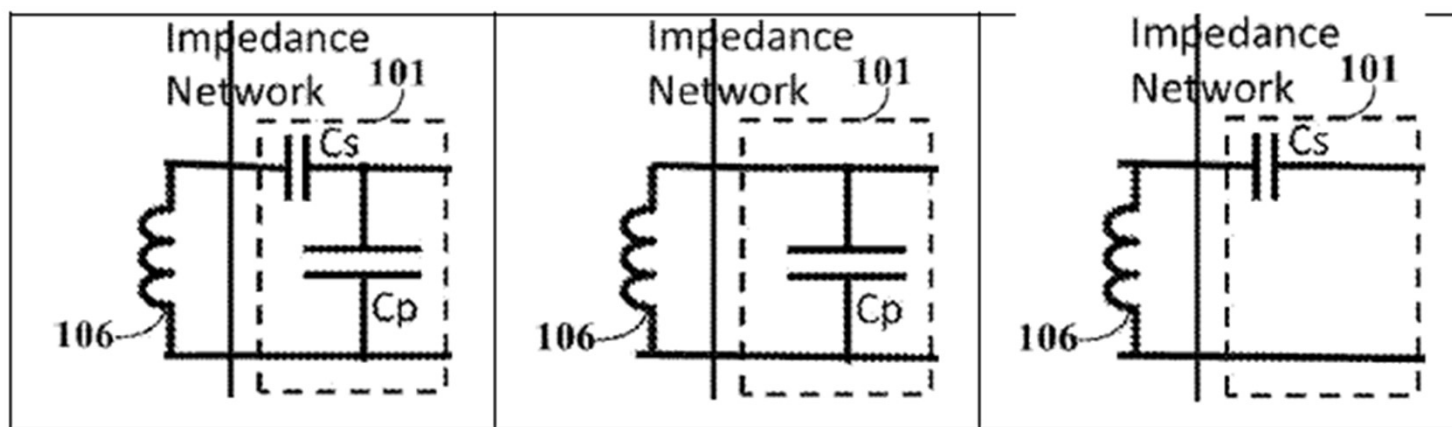
'339 Patent, Fig. 10E illustrates single capacitor impedance network 101

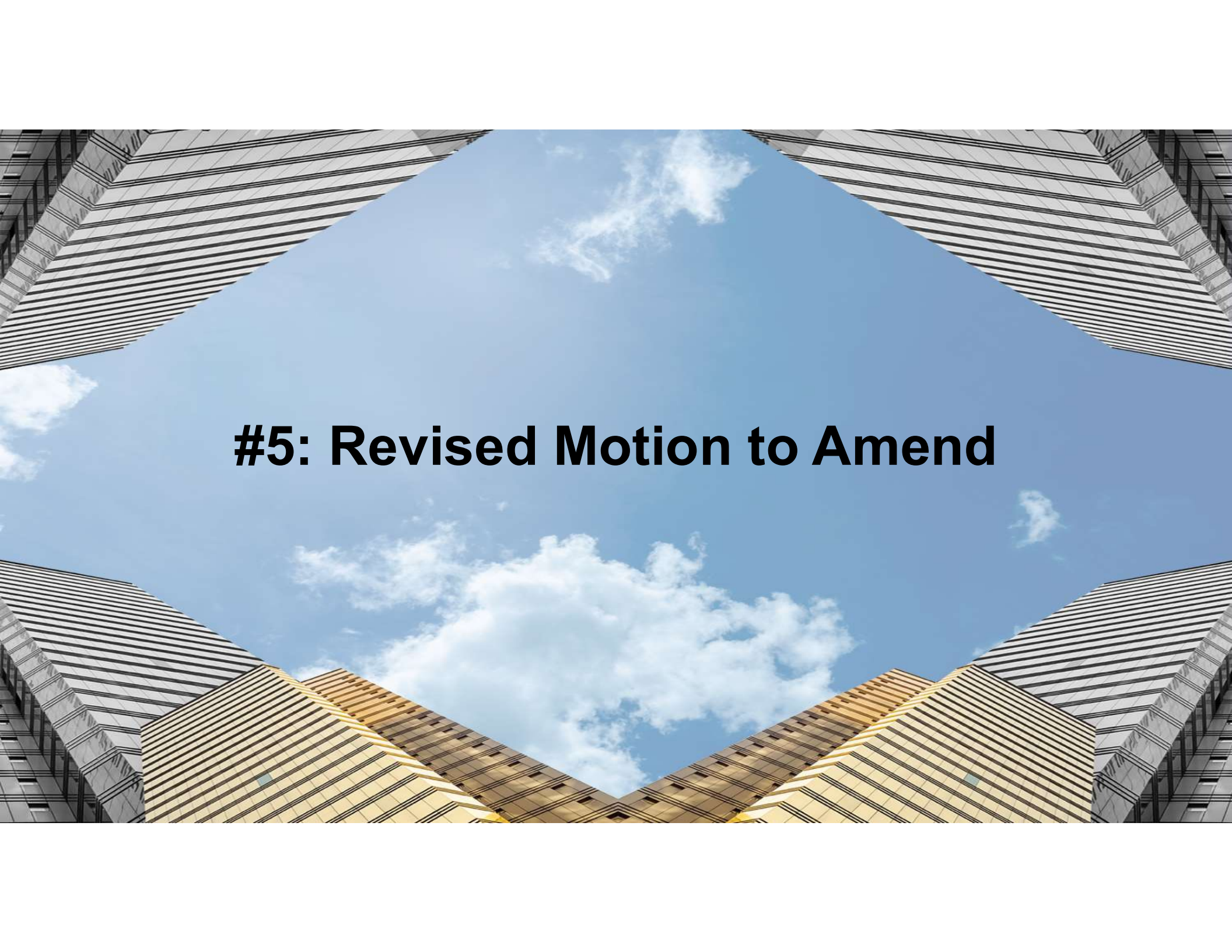
- Dr. Direen agreed that the impedance network 101 in Fig. 10E comprised of a single capacitor, C_s , constitutes the claimed “impedance network.”
Reply, 17.



Board Determined PO's Construction of "Impedance Network" Would Improperly Exclude Two of the Three Preferred Embodiments

- “By requiring that the claimed ‘impedance network’ include ‘two or more electrical components,’ Patent Owner’s proposed construction excludes two of three preferred embodiments of impedance network 101, i.e., the embodiment with single capacitor C_p connected in parallel with coil 106 and the embodiment with single capacitor C_s connected in series with coil 106.” DI, 26.



A low-angle, upward-looking photograph of several modern skyscrapers. The buildings are arranged in a circular pattern, creating a funnel-like effect that draws the eye towards the center. The sky is a vibrant blue, filled with soft, white, fluffy clouds. The lighting suggests a bright, sunny day, with the sun's rays creating a warm, golden glow on the lower parts of the buildings.

#5: Revised Motion to Amend

Proposed Substitute Claim 21 Largely Unchanged in the Revised Motion

Original Motion to Amend – Claim 21	Revised Motion to Amend – Claim 21
an impedance network <u>comprised of two or more electrical components from the list (i) one or more passive components, (ii) one or more active components, or (iii) one or more switches;</u>	an impedance network <u>comprising a collection of two or more electrical components, one of which must be a passive component and one of which must be either an active component or switch;</u>
configured to change, <u>while configured to receive said power, the</u> impedance of said impedance network and topology of said switch network to obtain a modified form of said received power,	configured to change, <u>while configured to receive said power, the</u> impedance of said impedance network and topology of said switch network to obtain a modified form of said received power,

Preliminary Guidance Found Lack of Written-Description Support

- Patent Owner argues that “*change topology ... of switch network*” would be understood by a POSA to mean “configured to change the topology in a way that changes the type of rectifier or the type of inverter or a rectifier to an inverter or an inverter to a rectifier of the switch network circuit.” Revised Motion, 19-20; Patent Owner Reply, 4.
- In it is Preliminary Guidance the Board determined that “the limitation containing that language lacks written-description support “ because the cited disclosures “**do not appear to disclose changing the impedance of the impedance network and the topology of the switch network during the power-receive mode**, i.e., while the apparatus remains in that mode.” Preliminary Guidance, 8.

Patent Owner Fails to Identify Additional Written-Description Support In '312 Provisional After Prelim. Guidance

Original Motion Cited Support to the 312 Provisional	Revised Motion Cited Support to the 312 Provisional	Reply Brief Cited Support to the 312 Provisional
'312 Provisional, [0004], [0007], [0032]	'312 Provisional, [0004], [0007], [0032]	Deposition Transcript of Dr. Randell Direen of Nov. 14, 2024 (EX1020, “Direen-Depo-2”), 53:6- 56:19
Original Motion, 6	Revised Motion, 14-16	Patent Owner Reply, 6-7

Patent Owner Fails to Identify Additional Written-Description Support In '312 Provisional After Prelim. Guidance

- In the cited testimony, Dr. Direen first admits that although the '312 Provisional discloses a “full synchronous full wave rectification mode” and a “half synchronous full wave mode,” the example that describes switching from one mode to another is missing in the '312 Provisional. Petitioner Sur-Reply, 7 (citing Direen-Depo-2(EX1020), 53:6-54:16).
- Dr. Direen identified the following disclosure in paragraph 4 of the '312 Provisional: “the first circuit, based on input from the control logic circuit, is configured to change the impedance – the impedance network and topology of the switch network...” Direen-Depo-2(EX1020), 54:22-55:13. However, Dr. Direen fails to explain how this disclosure teaches changes switching between two different types of rectifiers, and he fails to identify any disclosure in the '312 Provisional that does provide such a teaching. Petitioner Sur-Reply, 7

Patent Owner Proposed Construction for “*change topology ... of switch network*” is indefinite

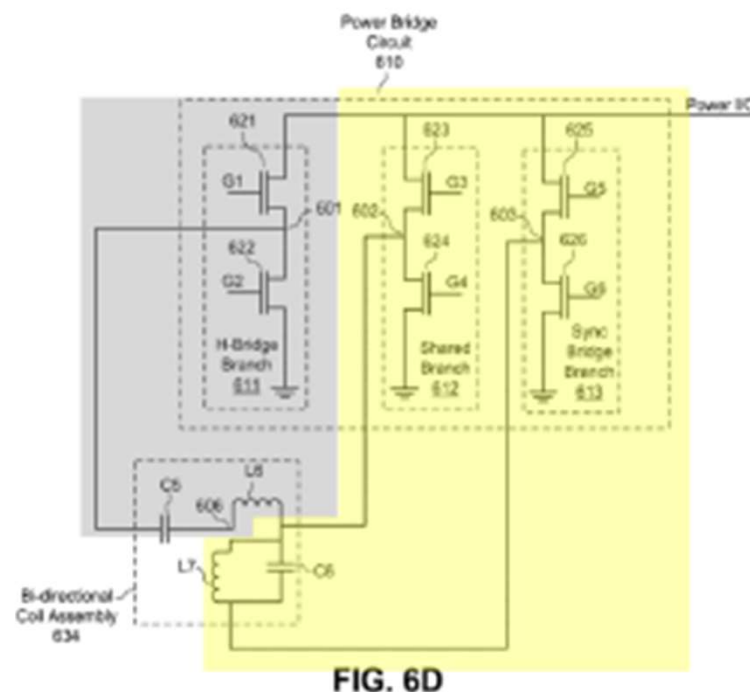
- Patent Owner argues that “*topology*” means “a group of circuit components that perform a type of rectification of a type of power inversion”; and “*change ... topology of said switch network*” means “configured to change topology in a way that changes the type of rectifier or the type of inverter or a rectifier to an inverter or an inverter to a rectifier of the switch network circuit.” Revised Motion, 19-20.
- Patent Owner proposes this construction in an attempt to rebut that Board’s conclusion in the Preliminary Guidance that “*change ... topology of said switch network*” should be construed broadly to encompass “changing the connected/disconnected states of the switches.” Preliminary Guidance, 17.

Patent Owner Proposed Construction for “*change topology ... of switch network*” is indefinite

- The term “type” is not used in the specification to describe inverter or rectifier category; instead, the specification refers to “classes” of inverter or rectifiers. Petitioner Sur-Reply, 5 (citing EX1001, 4:20-21).
- When asked whether the classes of inverters meet the proposed construction of a “type of inverter,” Patent Owner’s expert Dr. Direen testified that he “would have to study that offline.” Petitioner Sur-Reply, 5 (citing EX1020, p. 79).
- Patent Owner thus appears to acknowledge that the switches of the switch network can be “open” (i.e. in a disconnected state) or “closed” (i.e. in a connected state) so as to change the “topology” of the switch network— as is consistent with the plain and ordinary meaning of the term. But Patent Owner has provided no persuasive rationale for its position that changing the connected/disconnected state of the switches at a high frequency while “cycling” would not change topology. Petitioner Sur-Reply, 5.

MTA Opposition Ground 1: Under Correct Construction, Claim 21 is Obvious over Chatterjee in view of Corbridge, Cook, and the knowledge of a POSA

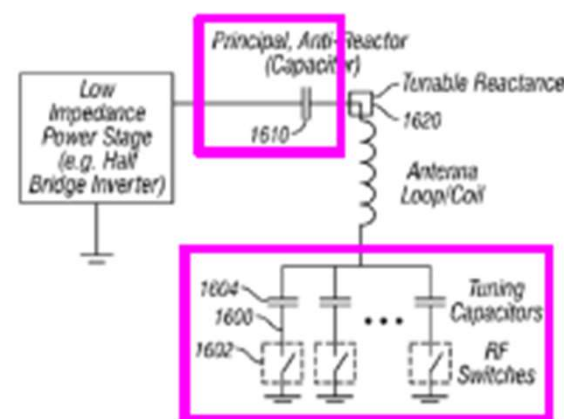
- Chatterjee discloses, as shown in Figure 6D, the coil assembly 635 comprises capacitors C5 and C6 that are connected between the coil inductor L6 and L7 and the switch network (Power Bridge Circuit 610). Second Opposition, 12 (citing Chatterjee(EX1003), Fig. 6D, 7E, 7F).



Power Receive Mode

MTA Opposition Ground 1: Under Correct Construction, Claim 21 is Obvious over Chatterjee in view of Corbridge, Cook, and the knowledge of a POSA

- Cook further discloses that the **capacitor** comprises “[c]apacitor bank (library) and electronic or mechanical **switches** (RF relays),”. Second Opposition, 14 (citing Cook(EX1017), ¶¶104-107).
- Cook explains that “[c]apacitive tuning can use a set of capacitors, e.g., **a capacitor bank, in a series or parallel arrangement with RF switches** that may be opened or closed to adjust the effective capacitance.” *Id.*
- A POSA would have found it obvious to modify Chatterjee to Cook(EX1017), Fig. 16. add Cook’s “capacitor bank ... with switches” to be connected in series with capacitor C6 as to be able to change impedance of the wireless power receiver in the charging mode.” *Id.*, 15.

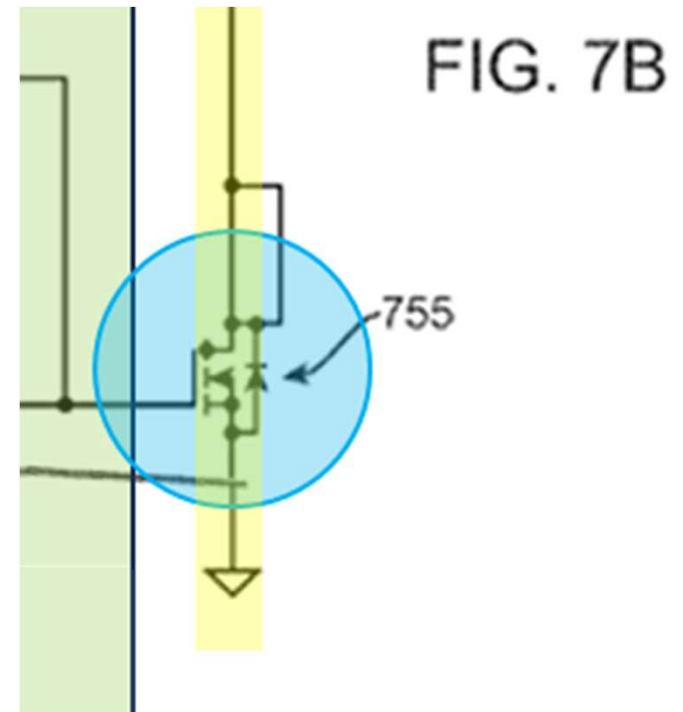


MTA Opposition Ground 2: Under Patent Owner's Construction, Claim 21 is Obvious over Chatterjee in view of Corbridge, Cook, and the knowledge of a POSA

- Corbridge discloses changing between non-synchronous rectifiers and synchronous rectifiers. Second Opposition, 21-24.
- Corbridge first teaches that four switches 753, 754, 755, 756 comprising transistor diode pairs can selectively operate as “a rectifier formed by diodes” (i.e. nonsynchronous), “a synchronous bridge” (i.e. full synchronous), or a “half synchronous bridge.” *Id.* (citing Corbridge, ¶¶85, 80; Phinney-Supp-2(EX1021), ¶84).

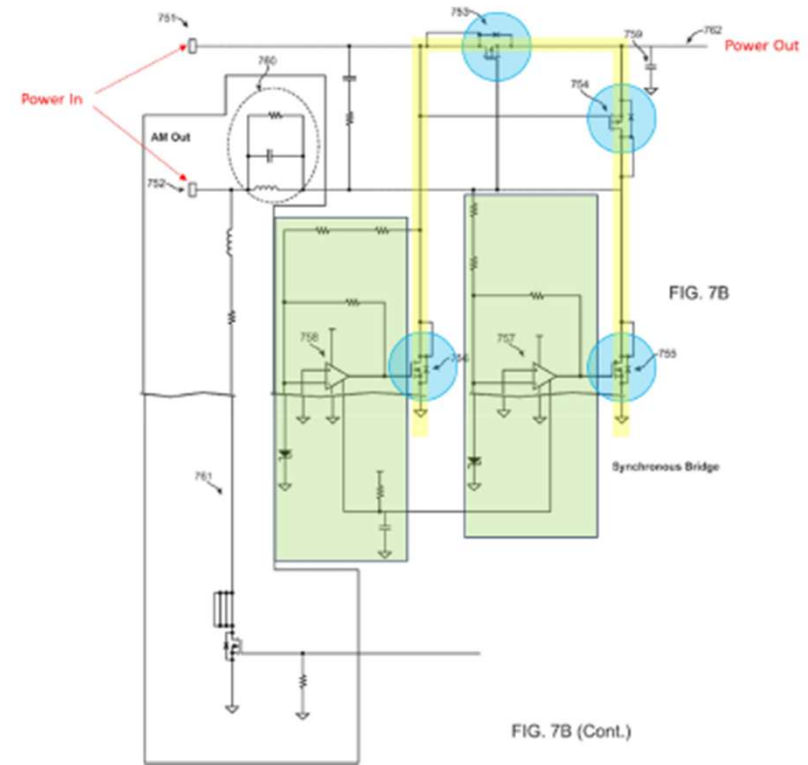
MTA Opposition Ground 2: Under Patent Owner's Construction, Claim 21 is Obvious over Chatterjee in view of Corbridge, Cook, and the knowledge of a POSA

- Corbridge discloses a “transistor diode pair 755” that first functions as a “diode” and then functions as a “transistor” when voltage is sufficient to drive the transistor. Corbridge, ¶86.
- “Op Amp 757 is configured and coupled to output a voltage level to turn on the transistor of transistor diode pair 755 when the diode of transistor diode pair 755 becomes forward-biased.” Corbridge, ¶86.



MTA Opposition Ground 2: Under Patent Owner's Construction, Claim 21 is Obvious over Chatterjee in view of Corbridge, Cook, and the knowledge of a POSA

- A POSA would have understood that the switches 755 and 756 first operate with their switches as diodes rather than transistors, before the transistors get “turn[ed] on” by Op Amp 757 and 758 which are driven by the input voltage. Second Opposition, 23 (citing Phinney-Supp-2(EX1021), ¶¶85; Corbridge, ¶¶86)
- The transistor requires a certain amount of voltage to drive it on and off. *Id.* (citing Phinney-Supp-2(EX1021), ¶¶85)



IPR2024-00023

Patent No. 10,038,339

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing **Petitioner's Demonstratives** were served electronically on January 7, 2025, on counsel of record for the Patent Owner as follows:

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Dated January 7, 2025

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