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Paper 29
Date: January 11, 2022

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PHILIP MORRIS PRODUCTS, S.A.,
Petitioner,

v.

RAI STRATEGIC HOLDINGS, INC.,
Patent Owner.

IPR2020-01094
Patent 9,930,915 B2

Before JEFFREY W. ABRAHAM, ELIZABETH M. ROESEL, and MICHELLE N. ANKENBRAND, *Administrative Patent Judges.*

ROESEL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Philip Morris Products, S.A. ("Petitioner") filed a Petition (Paper 2, "Pet.") seeking an *inter partes* review of claims 1–5 (the "challenged claims") of U.S. Patent No. 9,930,915 B2 (Ex. 1001, "the '915 Patent"). RAI Strategic Holdings, Inc. ("Patent Owner") filed a Preliminary Response. Paper 6 ("Prelim. Resp."). We instituted an *inter partes* review as to all claims challenged in the Petition. Paper 9 ("Inst. Dec.").

After institution, Patent Owner filed a Patent Owner Response (Paper 12, "PO Resp."), Petitioner filed a Reply (Paper 16, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 20, "PO Sur-reply"). An oral hearing was held on October 27, 2021, and a transcript of the hearing is included in the record. Paper 28.

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that all of the challenged claims of the '915 Patent are unpatentable.

B. Related Matters

The parties identify the following as related matters involving the '915 Patent and the same parties as this proceeding:

> *RAI Strategic Holdings, Inc. v. Altria Client Services LLC*, No. 1:20-cv-00393-LO-TCB (E.D. Va.); and
>
> *Certain Tobacco Heating Articles and Components Thereof*, Investigation No. 337-TA-1199 (Int'l Trade Comm'n) ("ITC investigation").

Pet. 3; Paper 4, 2 (Patent Owner's mandatory notices).

We note that co-pending PGR2020-00071 involves a patent related to the ’915 Patent.

C. The ’915 Patent (Ex. 1001)

The ’915 Patent relates to smoking articles that employ an electrical heating element and an electrical power source to provide an inhalable substance in a vapor or aerosol form, without substantially burning or completely burning tobacco or other substances. Ex. 1001, 2:14–22. The ’915 Patent discloses a reusable control unit that can be used with a disposable smoking article. *Id.* at 6:49–50.

Figure 1 of the ’915 Patent is reproduced below.

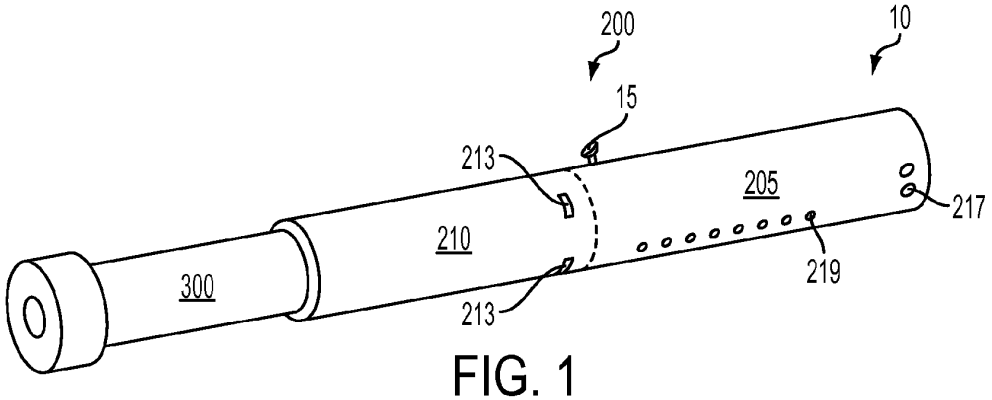


FIG. 1

Figure 1 depicts electronic smoking article 10 including reusable control housing 200 and disposable cartridge 300, which engage one another in a sliding manner. Ex. 1001, 7:44–47, 10:20–24, 11:43–47, 11:55–60. Control housing 200 includes control segment 205 and receiving chamber 210 into which cartridge 300 is inserted. *Id.* at 11:60–63.

Figure 4 of the ’915 Patent is reproduced below.

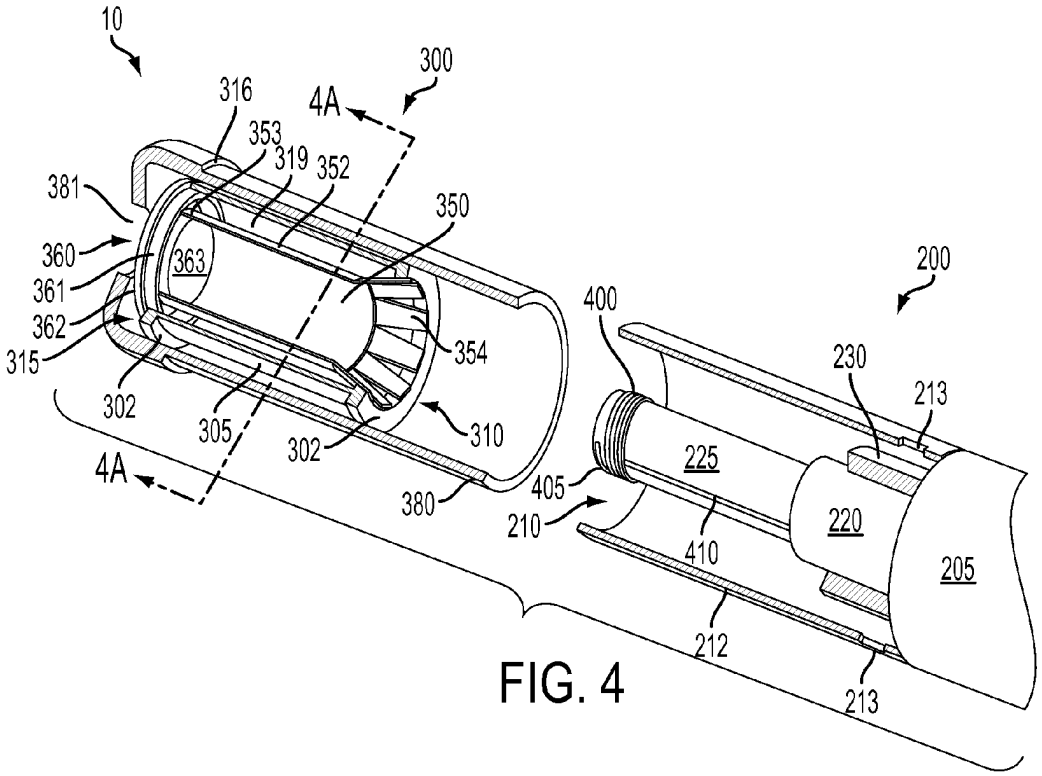


FIG. 4

Figure 4 is a partial cut away view of electronic smoking article 10 with cartridge 300 disengaged from control housing 200. Ex. 1001, 7:54–62, 12:20–24.

As shown in Figure 4, cartridge 300 comprises cartridge body 305 having engaging end 310 that engages receiving chamber 210 of control housing 200 and mouth end 315 that allows passage of an inhalable substance to a consumer. Ex. 1001, 12:24–31. Cartridge body 305 is tubular in shape and retains inhalable substance medium 350, e.g., a tobacco-derived material, which is also tubular in shape and releases an inhalable substance when heated by heating member 400. *Id.* at 12:38–41, 13:4–15, 16:20–22, 16:45–54.

Control housing 200 includes electrical energy source 220 having projection 225 extending therefrom. Ex. 1001, 23:13–18. Electrical energy

source 220 is connected via contacts 410 to electrical heating member 400, which is configured as coil 405 positioned near the terminal end of projection 225. *Id.* at 23:35–40, 24:17–20. Projection 225 is dimensioned to slide inside the interior space defined by inhalable substance medium 350 such that electrical heating member 400 is in proximity to inhalable substance medium 350 to heat the medium and release the inhalable substance. *Id.* at 23:23–29.

Figure 9 of the '915 Patent is reproduced below.

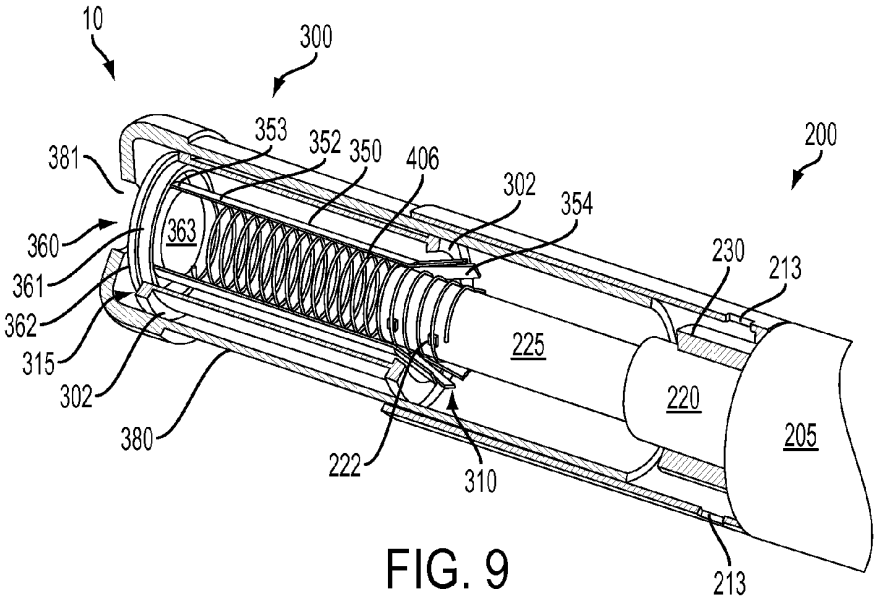


FIG. 9

Figure 9 is a partial cut away view of electronic smoking article 10 with cartridge 300 partially engaged with control housing 200. Ex. 1001, 8:53–62. In the Figure 9 embodiment, the electrical heating member is heating coil 406, which is positioned in the interior space of tubular inhalable substance medium 350 and is a component of cartridge 300, rather than control housing 200. *Id.* at 36:27–36. When the consumer inserts cartridge 300 into control housing 200, electrical leads 222 on projection

225 make an electrical connection with heating coil 406 so as to heat inhalable substance medium 350. *Id.* at 23:48–55, 36:44–56, 37:25–34.

The '915 Patent discloses that "[t]he control unit also can include further components, including an electrical power source (such as a battery), components for actuating current flow into a heating member, and components for regulating such current flow." Ex. 1001, 41:14–21; *see also id.* at 31:41–34:62 (discussing pushbutton and puff-actuated switching, current flow regulation, and electrical power source).

D. Illustrative Claim

The '915 Patent includes claims 1–5, all of which are challenged in the Petition. Claim 1 is the sole challenged independent claim and is reproduced below.

> 1. A reusable control unit for use with a disposable smoking article, the reusable control unit comprising a control housing including:
>
> a receiving end for receiving an engaging end of the disposable smoking article and having an electrical energy source that includes a projection extending outwardly therefrom and that includes a component that forms an electrical connection with electrical contacts on a separate electrical heating member; and
>
> a control unit section that houses a power source, a switching component that actuates flow of electrical current from the electrical energy source to the electrical heating member, and a flow regulating component that regulates a previously initiated current flow from the electrical energy source to the electrical heating member, wherein the component that forms an electrical connection with the electrical contacts is located on the projection.

Ex. 1001, 42:22–39.

E. Asserted Prior Art and Grounds

Petitioner asserts the following grounds of unpatentability:

	Claims Challenged	35 U.S.C. §	Basis
1	1–5	103(a)[1]	Deevi,[2] Brooks[3]
2	1–5	103(a)	Collins,[4] Brooks

F. Testimonial Evidence

Petitioner filed a declaration and reply declaration of Dr. Seetharama C. Deevi. Exs. 1003, 1043. Patent Owner cross-examined Dr. Deevi twice and submitted transcripts of the depositions as Exhibits 2016 and 2021.

Patent Owner filed a declaration of Charles E. Clemens. Ex. 2015. Petitioner cross-examined Mr. Clemens and filed a transcript of the deposition as Exhibit 1047.

II. ANALYSIS

A. Legal Standards

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the

[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the '915 Patent has an effective filing date before this date, the pre-AIA version of § 103 applies. Ex. 1001, code (62).

[2] Ex. 1005, US 5,498,855, issued March 12, 1996 ("Deevi").

[3] Ex. 1006, US 4,947,874, issued August 14, 1990 ("Brooks").

[4] Ex. 1007, US 5,505,214, issued April 9, 1996 ("Collins").

grounds for the challenge to each claim")); *see also* 37 C.F.R. § 42.104(b) (2021) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A patent claim is unpatentable under 35 U.S.C. § 103 "if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when presented, objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).[5]

Additionally, the obviousness inquiry typically requires an analysis of "whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2016) (requiring "articulated reasoning with some rational underpinning to support the legal conclusion of obviousness")). Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements," but "must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

[5] Neither party submits evidence of secondary considerations in this case.

B. Level of Ordinary Skill in the Art

Petitioner provides the following contention regarding a person of ordinary skill in the art ("POSA"):

> A POSA at the time of the purported invention (the August 2011 timeframe) would have had a Bachelor's degree in mechanical engineering, electrical engineering, chemistry, or physics, or a related field, and three to four years of industry experience, or a Master's degree in mechanical engineering, electrical engineering, chemistry, or physics, or a related field, and one to two years of industry experience. Such a POSA would have been familiar with electrically powered smoking articles and/or the components and underlying technology used therein.

Pet. 11 (citing Ex. 1003 ¶¶ 26–30). Patent Owner accepts Petitioner's description of a POSA for purposes of the trial in this proceeding. PO Resp. 16. For purposes of determining patentability of the challenged claims, we apply Petitioner's description of a POSA, which is supported by the testimony of both parties' experts (Ex. 1003 ¶ 28; Ex. 2015 ¶ 61) and is consistent with the scope and content of the '915 Patent and the asserted prior art.

C. Claim Construction

In an *inter partes* review, we apply the same claim construction standard as would be used by a district court to construe a claim in a civil action involving the validity or infringement of a patent. 37 C.F.R. § 42.100(b). Under that standard, claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Id.*; *Phillips*

v. AWH Corp., 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc); *Thorner v. Sony Comput. Entm't Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012).

The parties dispute the meaning of the term "electrical energy source," which we discuss below. We determine that no other claim term requires express construction for purposes of resolving the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy."); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (applying *Vivid Techs.* in the context of *inter partes* review).

Electrical energy source

Patent Owner argues that the term "electrical energy source" is expressly defined in the '915 Patent as a "receptacle that provides for transmission of electrical current from the power source to the heating member" and urges us to adopt that construction. PO Resp. 8, 11 (citing Ex. 1001, 4:5–7); PO Sur-reply 1. Patent Owner's proposed construction is the same as the one the Administrative Law Judge ("ALJ") adopted in the ITC investigation. Ex. 2008, 18 (claim construction order); Ex. 1049, 41 (incorporating claim construction order into the ALJ's initial determination on infringement, technical prong of domestic industry, and validity).

Petitioner argues the '915 Patent "does not define electrical energy source to be (or to require) a receptacle, and even if it did, it would not change the claim scope." Pet. Reply 3. Petitioner contends that Collins and Deevi each disclose an "electrical energy source," even if that term is construed as requiring a receptacle. *Id.* at 8, 27.

After the completion of briefing in this proceeding, the International Trade Commission ("ITC" or "Commission") issued an opinion modifying the ALJ's claim construction for "electrical energy source." Ex. 2022, 21 ("Commission Opinion"). According to the Commission, the term means a "receptacle that provides for transmission of electrical current from the power source to the heating member, where the receptacle is not limited to a structure that requires wiring or insertion." *Id.* at 21, 29.[6]

Patent Owner relies on the Commission Opinion as support for Patent Owner's proposed claim construction. Tr. 26:12–28:5. Petitioner, on the other hand, argues that the claim term does not need to be construed, but if we adopt the ITC's claim construction, it "really has no practical effect because the result is the same." Tr. 11:19–12:2.

We do not agree with Patent Owner that that the Specification expressly defines "electrical energy source" as a receptacle. The standard for finding patentee lexicography is "exacting." *GE Lighting Solutions, LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014). "To act as its own lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term,' and 'clearly express an intent to define the term.'" *Id.* (citing *Thorner*, 669 F.3d at 1365).

Patent Owner argues that the '915 Patent expressly defines "electrical energy source" in the following passage from the Summary of the Invention: "[t]he electrical energy source can essentially be a receptacle that provides for transmission of electrical current from the power source to the heating

[6] Based on the modified construction, the Commission affirmed the ALJ's findings in favor of Patent Owner on infringement, invalidity, and the technical prong of domestic industry with respect to the '915 Patent. Ex. 2022, 27, 29.

member." PO Resp. 8 (quoting Ex. 1001, 4:5–7). Patent Owner argues that the '915 Patent "reiterates and elaborates on this definition" in the following passage from the Detailed Description:

> The electrical energy source 220 can be characterized as being an electrical receptacle that is in electrical connection with a power source 275 (shown in FIG. 6) and that provides for switch-operated delivery of electrical energy to the heating member 400, such as via the contacts 410, as illustrated in FIG. 4.

Id. at 8–9 (quoting Ex. 1001, 23:35–40).

The statement in the '915 Patent that "[t]he electrical energy source can essentially be a receptacle . . ." (Ex. 1001, 4:5–7) does not purport to be definitional. *Medicines Co. v. Mylan, Inc.*, 853 F.3d 1296, 1306 (Fed. Cir. 2017) (determining that statement from the specification "does not purport to be definitional because it does not accord with the linguistic formula used by the patentee to signal the designation of other defined terms").

When the '915 Patent provides a definition, it does so unambiguously. For example, the '915 Patent includes the following passage that defines the term "smoking article."

> As used herein, the term [smoking article] is intended to mean an article that provides the taste and/or the sensation (e.g., hand-feel or mouth-feel) of smoking a cigarette, cigar, or pipe without the actual combustion of any component of the article. The term smoking article does not necessarily indicate that, in operation, the article produces smoke in the sense of the by-product of combustion or pyrolysis. Rather, smoking relates to the physical action of an individual in using the article--e.g., holding the article in a hand, drawing on one end of the article, and inhaling from the article.

Ex. 1001, 9:42–51.

As illustrated by the foregoing passage, when defining terms, the '915 Patent uses language that clearly signals that a definition is being

provided, including the introductory phrase, "as used herein," followed by the words "the term" and "intended to mean." *Id.* In contrast, the passages Patent Owner relies upon are not consistent with the linguistic format the patentee used when defining terms. These passages use the non-limiting language, "can essentially be" or "can be characterized as" (Ex. 1001, 4:5–7, 23:35–40), and they lack any of the semantic conventions used in the '915 Patent when defining terms.[7] For these reasons, we find that the Specification passages Patent Owner relies upon do not meet the exacting standard necessary to find patentee lexicography. *GE Lighting*, 750 F.3d at 1309.

Patent Owner additionally argues that the Specification "consistently uses the 'receptacle' language when describing or discussing the 'electrical energy source 220,' and at times uses the terms interchangeably." PO Resp. 9 (citing Ex. 1001, 4:14–19, 4:63–66, 5:8–12, 7:14–16, 9:12–22, 23:40–48, 37:58–63, 39:23–27, 39:65–40:3). To illustrate this point, Patent Owner relies on the following passage from the Specification: "[e]lectrical contacts present on the heating member permanently engage *the receptacle*

[7] *See Medicines*, 853 F.3d at 1306 (finding that because the statement patent owner relied on departs from the format used in the patent in defining terms, including the defined term in quotation marks, followed by the words "refers to" or "as defined herein," the statement "lacks the clear expression of intent necessary for a patentee to act as its own lexicographer"); *see also Abbott Labs. v. Andrx Pharms., Inc.*, 473 F.3d 1196, 1210 (Fed. Cir. 2007) (finding that although "[t]he word 'is' may signify that a patentee is serving as its own lexicographer," "there is significant evidence . . . that the patentee . . . was not providing a definition," including that the patent "unambiguously provides definitions of other claim terms" by setting them off by quotation marks followed by the words, "as used herein, means.").

(i.e., the electrical energy source) so that electrical current can be delivered to the heating member." *Id.* at 9–10 (citing Ex. 1001, 4:63–66).

We disagree that the Specification of the '915 Patent uses the terms "electrical energy source" and "receptacle" interchangeably. When the '915 Patent uses terms interchangeably, it does so expressly and unambiguously. For example, the '915 Patent states that the inventive articles can be characterized as "smoking articles," "vapor-producing articles, aerosolization articles, or pharmaceutical delivery articles" and that these terms "are understood to be interchangeable unless stated otherwise." Ex. 1001, 9:40–42, 9:51–54, 9:67–10:2. Similarly, the patent states that "[i]n some embodiments, the terms [vapor state or aerosol state] may be interchangeable." *Id.* at 9:62–67. In yet another example, the '915 Patent explains:

> When the heating member heats the inhalable substance medium, an inhalable substance is formed from, released from, or generated from the inhalable substance medium in a physical form suitable for inhalation by a consumer. It should be noted that ***the foregoing terms are meant to be interchangeable*** such that reference to release, releasing, releases, or released includes form or generate, forming or generating, forms or generates, and formed or generated.

Id. at 10:10–18 (emphasis added).

In contrast, the passage relied on by Patent Owner does not show that the terms "electrical energy source" and "receptacle" are used interchangeably in the '915 Patent. The phrase, "the receptacle (i.e., the electrical energy source)," merely explains that, in the embodiment being described, the receptacle is the electrical energy source. Ex. 1001, 4:63–66.

The '915 Patent includes numerous instances in which a parenthetical phrase is introduced by the Latin abbreviation "i.e." to signal that the phrase

is an explanation or definition of the term that precedes it. *Id.* at 9:58–59 ("a vapor (i.e., a substance that is in the gas phase at a temperature lower than its critical point)"); *id.* at 9:60–62 ("an aerosol (i.e., a suspension of fine solid particles or liquid droplets in a gas)"); *id.* at 10:38–39 ("a car charger (i.e., cigarette lighter receptacle)"); *id.* at 13:12–15 ("a tobacco-derived material (i.e., a material that is found naturally in tobacco that may be isolated directly from the tobacco or synthetically prepared); *id.* at 13:22–25 ("tobacco condensates or fractions thereof (i.e., condensed components of the smoke produced by the combustion of tobacco, leaving flavors and, possibly, nicotine)"). Consistent with these usages in the '915 Patent, the Latin abbreviation "i.e." in the phrase, "the receptacle (i.e., the electrical energy source)" is used to signal that "the electrical energy source" is an explanation or definition of "receptacle," ***not*** the other way around. *TF3 Ltd. v. Tre Milano, LLC*, 894 F.3d 1366, 1372 (Fed. Cir. 2018) ("The usage 'i.e.' ('*id est*' or 'that is'), 'signals an intent to define the word to which it refers'" (quoting *Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1334 (Fed. Cir. 2009)).

Still further, Patent Owner argues that the '915 Patent reinforces its disclosure that the "electrical energy source" is a receptacle by describing different types of receptacles, including a receptacle into which electrical "contacts may be permanently inserted" and a receptacle into which electrical "contacts are not permanently inserted." PO Resp. 10 (citing Ex. 1001, 23:40–48); PO Sur-reply 2–3. In our view, however, the cited disclosures describe various embodiments that include a receptacle as the electrical energy source, but do not support Patent Owner's contention that the term "electrical energy source" is expressly defined as a "receptacle."

For these reasons, we are not persuaded that the Specification of the '915 Patent expressly defines "electrical energy source" as a "receptacle," as Patent Owner argues. Patent Owner does not assert that there is any disavowal of claim scope either in the Specification or during prosecution of the '915 Patent. In the absence of patentee lexicography or disavowal, the term "electrical energy source" must be given its "ordinary and customary meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history," which does not require a "receptacle." *Thorner*, 669 F.3d at 1365.

For these reasons, we are not persuaded to adopt Patent Owner's narrow construction for "electrical energy source." As discussed below, however, Petitioner shows persuasively that the challenged claims are unpatentable even under Patent Owner's narrow construction, and our claim construction analysis provides an alternative basis for our determination.

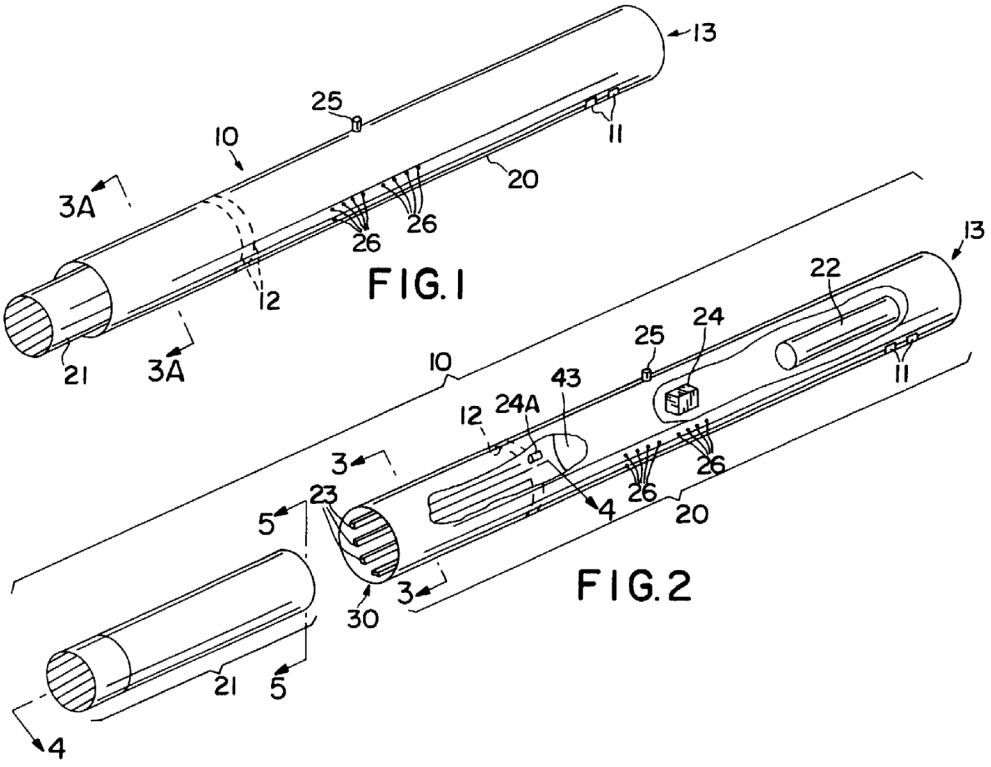
D. Petitioner's Collins-led Ground

Petitioner challenges claims 1–5 based on Collins alone or in combination with Brooks. Pet. 6, 46–75. Patent Owner disputes that challenge. Prelim. Resp. 45–71. We provide an overview of the asserted references before turning to the parties' contentions and our analysis.

1. Collins (Ex. 1007)

Collins discloses an electrically heated smoking article. Ex. 1007, 1:16–19.

Figures 1 and 2 of Collins are reproduced below.



Collins Figures 1 and 2 show electrical smoking article 10, including reusable portion 20 and disposable tobacco flavor unit 21, which is received in cavity 30 at the mouth end of portion 20. Ex. 1007, 3:30–33, 7:32–37. Reusable portion 20 includes power source 22 and heating elements 23, which are energized under the control of control circuit 24, which is in turn actuated by puff-actuated sensor 24A or by pushbutton 25. *Id.* at 7:38–49.

Figure 10 of Collins is reproduced below.

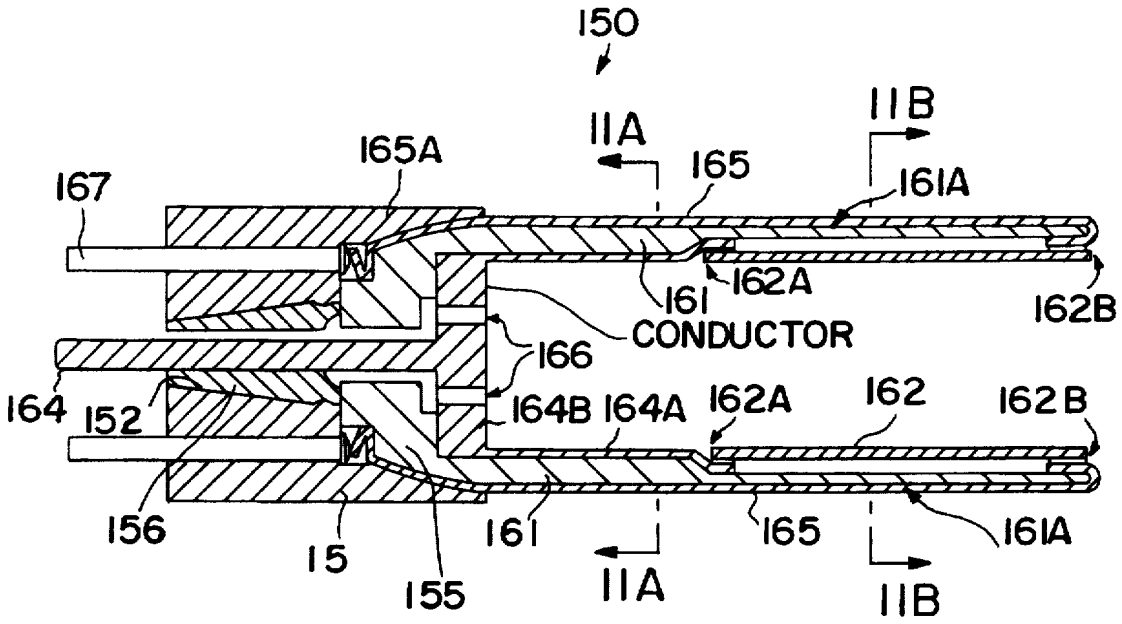


FIG. 10

Collins Figure 10 shows heater unit 150 for an electrical smoking article. Ex. 1007, 4:1–3, 11:46–47. Heater unit 150 includes heater base 151 (mislabeled "15" in Figure 10),[8] heater support 155, and a plurality of circumferentially-spaced heater support arms 161, all made from thermally-stable electrically insulating material. *Id.* at 11:48–51; *see also id.* at Figs. 11A, 11B (showing circumferentially-spaced heater support arms 161). A plurality of heaters 162 are mounted on heater support arms 161 and have opposite ends 162A and 162B. *Id.* at 11:51–55. Heater ends 162A are all electrically connected to common terminal 164 via conducting fingers 164A and conducting plate 164B. *Id.* at 11:53–60. Heater ends 162B are individually connected to terminals 167 via conducting fingers 165, thereby allowing for individual activation of each heater 162. *Id.* at 11:63–12:1.

[8] *See* Pet. 55 n.7; Prelim. Resp. 46.

2. Brooks (Ex. 1006)

Brooks "relates to cigarettes and other smoking articles such as cigars, pipes, and the like, which employ an electrical resistance heating element and an electrical power source to produce a tobacco flavored smoke or aerosol." Ex. 1006, 1:6–10. Brooks is incorporated by reference in the '915 Patent, which states that Brooks discloses suitable puff-actuated and timer-based controllers, including associated sensors and circuitry. Ex. 1001, 33:35–39, 34:21–25.[9]

3. Claim 1

We begin by addressing the disputed elements of claim 1 before turning to the undisputed elements.

a) Receiving end

Claim 1 recites a "reusable control unit for use with a disposable smoking article, the reusable control unit comprising a control housing including: a receiving end for receiving an engaging end of the disposable smoking article and having an electrical energy source." Ex. 1001, 42:22–27.

Petitioner contends that "Collins' control housing (tube or wall 31 of portion 20) includes a receiving end (the end with cavity 30) for receiving an engaging end of the disposable smoking article (the end of disposable tobacco unit 21 inserted into Collins' portion 20)." Pet. 51. To illustrate

[9] Petitioner contends that, in the event the claim terms "switching component" and "flow regulating component" are construed under 35 U.S.C. § 112(6), then Brooks discloses these limitations. Pet. 12–14, 38–43, 68–72. Patent Owner does not dispute Petitioner's contentions about Brooks, the "switching component," or the "flow regulating component."

that contention, Petitioner provides the following colored version of Collins Figure 2:

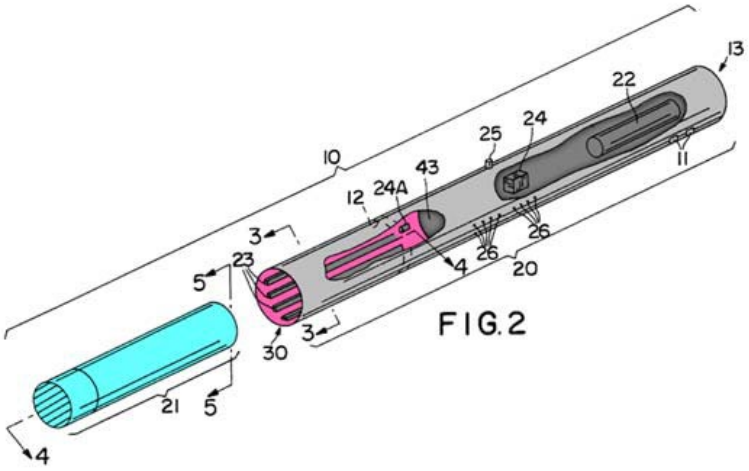


FIG. 2

Id. (citing Ex. 1007, 4:27–33). Collins Figure 2 shows a smoking article, and in Petitioner's colored version, tobacco flavor unit 21 is aqua, and cavity 30 is pink. Petitioner contends that the receiving end of Collins' housing receives the engaging end of the smoking article such that the heaters surround the portion that contains tobacco. *Id.* at 52–53 (citing Ex. 1007, 7:32–37, 8:20–32). Petitioner illustrates that contention with the following modified and colored versions of Collins Figure 4.

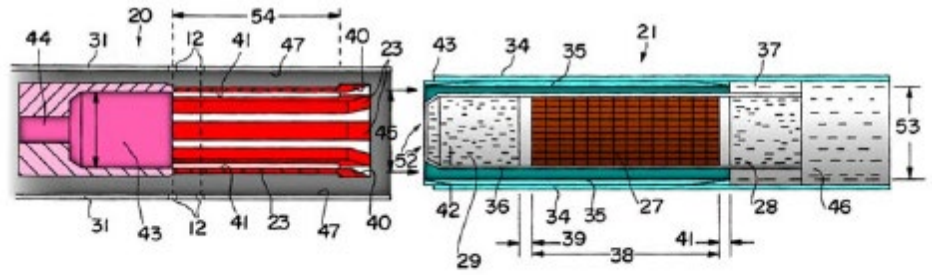
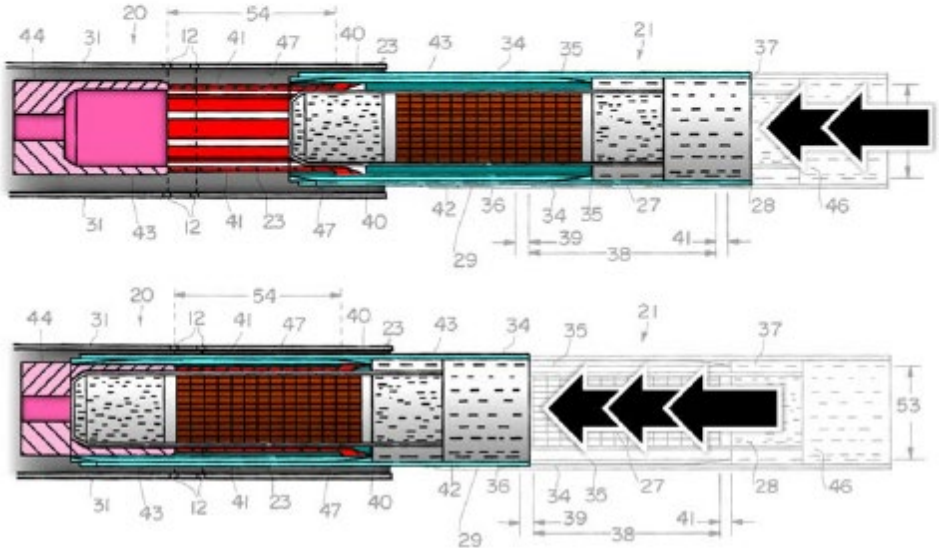
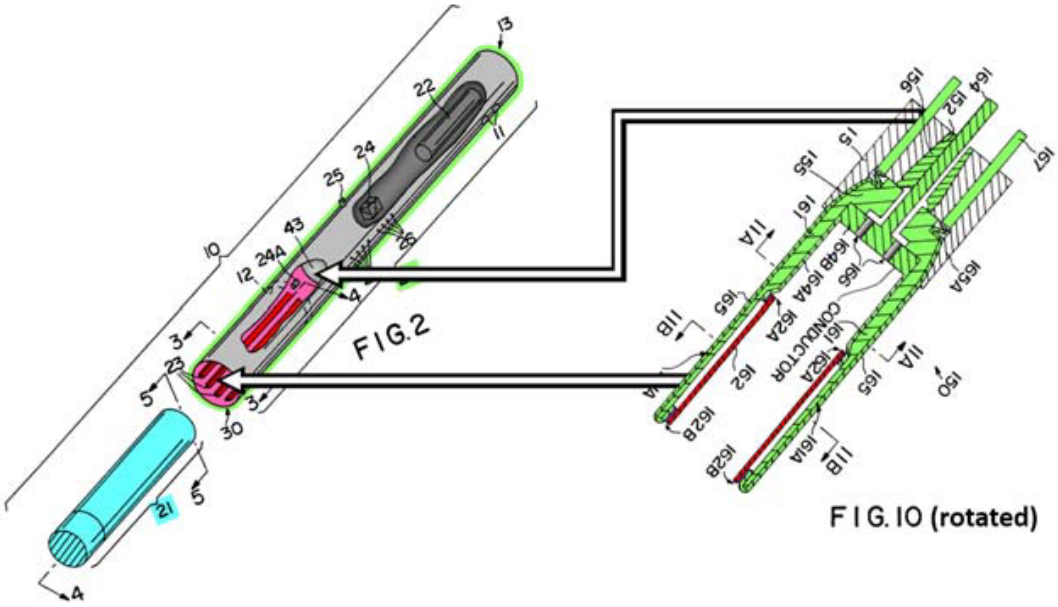


FIG.4



Pet. 53. Petitioner's modification of Collins Figure 4 shows stepwise how tobacco flavor unit 21 (aqua) is inserted into cavity 30 (pink) of reusable portion 20.

Petitioner contends that components of Collins' heater assembly are an "electrical energy source," as claimed (Pet. 55), and that the heater assembly is placed inside Collins' control housing, as illustrated by the following annotation of Collins Figures 2 and 10.



Pet. 56. Collins Figure 2 shows a smoking article, and Collins Figure 10 shows a heater unit of the smoking article. Petitioner's annotations indicate where the heater unit (green) is located within the smoking article, which includes tobacco flavor unit 21 (aqua), cavity 30 (pink), and heaters 23 (red).

Patent Owner argues that "the Petition makes no attempt to identify the boundaries of Collins' alleged 'receiving end,' nor to show that any portion of the alleged 'electrical energy source' (much less all of it) is present in the receiving end." PO Resp. 45–46. Similarly, Patent Owner argues that "the Petition makes no showing that any part of the alleged 'electrical energy source' structure of Collins is present in the 'end with cavity 30' (*i.e.*, the alleged 'receiving end')." *Id.* at 47.

After considering the parties' arguments and evidence, we determine that Petitioner shows persuasively that Collins discloses a control housing that includes "a receiving end . . . having an electrical energy source."[10] The

[10] For purposes of our analysis of the "receiving end" limitation, we accept Petitioner's undisputed contention that the electrical energy source includes all components of Collins' heater assembly except for heaters 162 and the

parties agree that this limitation is satisfied if any portion of the electrical energy source is in the receiving end, which is consistent with the Specification of the '915 Patent. PO Resp. 2; Pet. Reply 12; Ex. 1001, 2:51–55. With its annotations of Collins Figures 2 and 10 above, Petitioner shows persuasively that Collins discloses a receiving end (pink) for receiving the disposable smoking article (aqua), where the receiving end includes at least a portion of the electrical energy source (green). Pet. 51, 56; Pet. Reply 12.

Our finding is supported by Figures 2, 4, and 10 of Collins, which show cavity 30 at the mouth end of reusable portion 20 of the smoking article and heaters 23 and the portion of the heating assembly that supports the heaters (i.e., a portion of the "electrical energy source") surrounding cavity 30. Ex. 1007, Figs. 2, 4, 10. With reference to these figures, Collins discloses that "[a]rticle 10 includes reusable or 'permanent' portion 20 and disposable tobacco flavor unit 21 which is received in a permanent cavity 30 at the mouth end of portion 20." *Id.* at 7:34–37. In addition, Collins discloses that "[w]hen tobacco flavor unit 21 is inserted in cavity 30 of reusable portion 20, aerosol barrier tube 35 fits over the outside surface 51 of heater elements 23 whereas back-flow filter 29, tobacco flavor material 27 and free-flow filter 28 fit into cavity 30." *Id.* at 8:28–32.

With reference to Figures 2, 4, and 5 of Collins, Petitioner shows persuasively that the "receiving end" in Collins includes at least as much of reusable portion 20 as receives disposable tobacco unit 21. Pet. 51–53. When fully inserted in reusable portion 20, the engaging end of disposable

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base into which the assembly is inserted. Pet. 55; *see also* PO Resp. 47 (accepting Petitioner's identification of an "electrical energy source" for purposes of Patent Owner's arguments about the "receiving end").

tobacco flavor unit 21 is positioned within back-flow filter cavity 43 of cavity 30, and tobacco flavor material 27 is surrounded by heater elements 23. Ex. 1007, 8:28–36, Figs. 1, 4; Pet. 53. The "receiving end" in Collins therefore extends the entire length of cavity 30 and includes heater elements 23, as well as heater support arms 161, which are part the electrical energy source. Ex. 1007, 8:28–36, 11:46–52, Figs. 1, 4, 10; Pet. 51–53, 55–56; Pet. Reply 13. We are persuaded by Petitioner's argument that, in Collins, "the electrical energy source's projection protrudes just as far or farther into the receiving end as the heaters themselves." Pet. Reply 14 (providing colored version of Collins Figure 10). Accordingly, we find that at least the portion of the electrical energy source that supports the heaters is located at the receiving end of Collins' smoking article.

Contrary to Patent Owner's arguments (PO Resp. 2, 45–46, 48; PO Sur-reply 12), the Petition identifies a "receiving end" in Collins with sufficient precision. The Petition states: "Collins' control housing (tube or wall 31 of portion 20) includes a receiving end (the end with cavity 30) for receiving an engaging end of the disposable smoking article (the end of disposable tobacco unit 21 inserted into Collins' portion 20)." Pet. 51. Petitioner does not need to identify the boundaries of Collins' receiving end any more precisely.

The '915 Patent does not identify the exact boundaries of the "receiving end." Instead, the '915 Patent identifies the "receiving end" by its structural and functional relationship to other parts of the smoking article. For example, the '915 Patent discloses:

> The article also can comprise a control housing having a ***receiving end*** that engages the engaging end of the cartridge. ***Such receiving end may particularly include a chamber with an open end for receiving the engaging end of the cartridge***.

> The control housing further can comprise an ***electrical energy source (at least part of which can be positioned at the receiving end and/or within the receiving chamber)*** that provides power to the electrical heating member.

Ex. 1001, 2:47–55 (emphasis added); *see also id.* at 42:22–27 (claim 1 reciting "a receiving end for receiving an engaging end of the disposable smoking article").

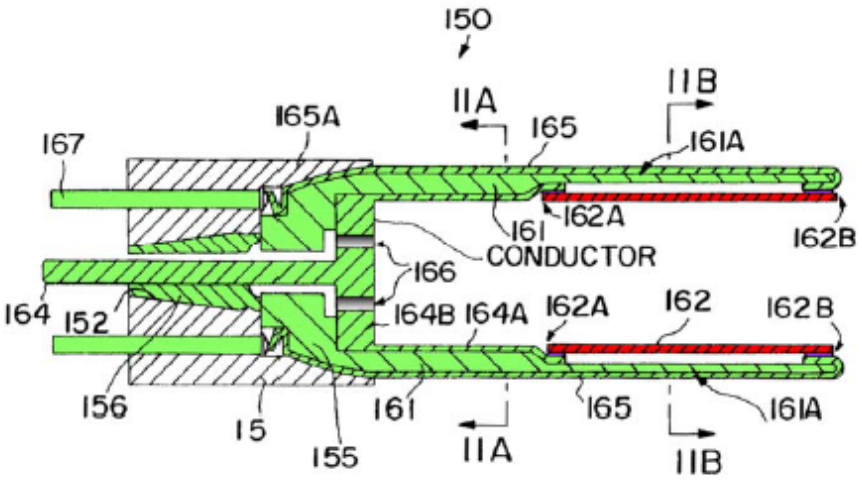
We find that Collins discloses a "receiving end" in the same way as described and claimed in the '915 Patent. Like the "receiving end" in the '915 Patent, the receiving end in Collins includes a chamber (cavity 30) with an open end for receiving an engaging end of a cartridge (tobacco flavor unit 21), and at least part of the electrical energy source—heater support arms 161—is positioned at the receiving end and/or within the receiving chamber. Ex. 1007, 7:34–37, 8:28–32, 11:46–52, Figs. 2, 4, 10.

Patent Owner argues that Collins "suggests" that the heaters and connected portion of the electrical energy source are "spaced away from" and not within the receiving end. PO Resp. 48–49 (quoting Ex. 1007, 8:4–7). Patent Owner's argument is not supported by Collins, which discloses that "heating elements 23 . . . extend[] from a point ***slightly*** spaced away ***from the mouth end of cavity 30*** to a point slightly spaced away from back-flow filter cavity 43." Ex. 1007, 8:4–7 (emphasis added). As shown in Collins Figure 4, heaters 23 extend from a point close to the mouth end of cavity 30 to a point close to back flow filter cavity 43. *Id.*, Fig. 4. Patent Owner's argument incorrectly equates the "***end of cavity 30***" with the claimed "receiving end," contrary to Petitioner's contention, which identifies the ***end of portion 20 with cavity 30*** as the "receiving end" of the control housing. Pet. 51.

Patent Owner argues that Petitioner makes new arguments in the Reply because the Petition "never equated the portion in pink with the claimed 'receiving end.'" PO Sur-reply 12 (referring to Petitioner's annotation at Pet. 56 and Petitioner's argument at Pet. Reply 12). We disagree. The Petition identifies a receiving end in Collins as "the end with cavity 30," which is colored pink in Petitioner's annotation. Pet. 51.

b) Electrical energy source

Petitioner contends that Collins discloses an electrical energy source that "includes all of the components of its heater assembly . . . except the heaters 162 and the base into which the assembly is inserted." Pet. 55 (footnote omitted). Petitioner illustrates its contention with the following colored version of Collins Figure 10.



Pet. 56. Collins Figure 10 shows a heater unit for a smoking article, and in Petitioner's colored version, the structures Petitioner identifies as an "electrical energy source" are green, and heaters 162 are red. Petitioner contends that "[l]ike the 'electrical energy source' in the '915 patent, Collins' electrical energy source provides for transmission of electrical

current from the power source to the heating member." *Id.* (citing Ex. 1003 ¶¶ 245–248; Ex. 1007, 11:53–12:11).

Patent Owner argues that Collins does not disclose an "electrical energy source," regardless of whether the term is construed as requiring a receptacle. PO Resp. 49–58. Patent Owner characterizes the structure Petitioner identifies as an "electrical energy source" in Collins as a group of separate electrical conductors supported by a housing. *Id.* at 50–51, 53, 56–57. According to Patent Owner, this structure is not a "receptacle" because "it is not capable of receiving anything" (*id.* at 51), and in any case, "the POSA would not understand the term 'electrical energy source' to read on a group of separate conductors supported by a housing" (*id.* at 57).

After considering the parties' arguments and evidence, we determine that Petitioner shows persuasively that Collins discloses an "electrical energy source," regardless of whether the term is construed as requiring a receptacle. We address the parties' dispute under each claim construction below.

(1) "Electrical energy source" under Patent Owner's "receptacle" construction

Patent Owner argues that "a receptacle is a structure that is capable of *receiving something*," and "[t]his can be receiving a physical structure, or receiving electrical power." PO Resp. 28–29 (citing dictionary definitions in Exs. 2017–2019). Petitioner contends that "Collins' electrical energy source meets Patent Owner's 'receptacle' construction because it receives *both* a physical structure *and* electrical power." Pet. Reply 8. We agree with Petitioner.

Petitioner shows persuasively that Collins discloses an electrical energy source that includes all of the components of the heater assembly

shown in Figure 10 except for heaters 162 and base 151. Pet. 55–56. The electrical energy source in Collins includes heater support 155, heater neck 156, heater support arms 161, terminals 167, conductor fingers 165 with bends 165A, conductor fingers 164A, conducting plate 164B, and common terminal 164. *Id.*; Ex. 1007, 11:46–12:11, Fig. 10.

We find that Collins' electrical energy source receives a physical structure, namely conductor fingers 165 shown in Figure 10. Ex. 1007, 11:63–12:11, Fig. 10; *see* Pet. Reply 8 (asserting that conducting fingers 165 are a physical structure received by the electrical energy source). These conductors form an electrical connection with terminals 167 when heater support 155 snap-fits into heater base 151 and bends 165A make electrical contact with terminals 167. Ex. 1007, 12:1–11; *see* Pet. Reply 8; *see also* Pet. 58, 62–63 (asserting that conducting fingers 165 are a "component" that makes an electrical connection with terminals 167 when the heater unit snap-fits into the base). Patent Owner concedes that heater base 151 with terminals 167 is a "receptacle" that receives heater support 155 and associated structure. PO Resp. 65, 67. The associated structure includes heater support arms 161 and "[c]onductor fingers 165, which run along the outer edge 161A of heater support arms 161." *Id.*; Ex. 1007, 11:63–65, Fig. 10.

We find that Collins' conductor fingers 165 are a physical structure that the electrical energy source, including terminals 167, receives in the same way the '915 Patent discloses that electrical energy source 220 receives contacts 410. *Compare* Ex. 1007, 11:63–12:11, Fig. 10, *with* Ex. 1001, 23:35–48, 39:63–40:4, Figs. 4, 12; *see* Pet. Reply 8–10 (providing colored versions of Figure 10 of Collins and Figures 4 and 12 of the '915 Patent to show similar arrangements of corresponding parts).

We have considered Patent Owner's argument that, in Collins, "terminals 167 make an electrical connection with the fingers 165 but do not receive them" because "pressing up against something is not the same as receiving it in a receptacle." PO Sur-reply 7. We find that Patent Owner's argument is inconsistent with Patent Owner's own claim construction, which "does not require [that] something be inserted into the claimed electrical energy source." *Id.* at 3 (quoting Ex. 1049, 52–53 (ALJ initial determination)); *see* Ex. 1001, 23:49–55 (describing Figure 9 embodiment, in which the electrical energy source makes electrical contact with the heating member, without insertion of any contacts into the electrical energy source). Even if insertion were required, however, Collins meets that requirement by disclosing that "heater support 155 'snap fits' into heater base 151 by inserting heater neck 156 into base collar 152, which thus provides for continuous electrical contact between connectors 167 and ends 162B of heaters 162." Ex. 1007, 12:1–6.

Petitioner shows persuasively that, in Collins, the electrical energy source receives electrical power. Pet. 56–57, 60–61; Pet. Reply 10–11. As discussed above, Collins discloses an electrical energy source that includes terminals 167, conductor fingers 165 with bends 165A, conductor fingers 164A, conducting plate 164B, and common terminal 164. Ex. 1007, 11:54–12:1, Fig. 10; *see* Pet. 55–56 (identifying electrical energy source with reference to Collins Figure 10). Like the electrical energy source in the '915 Patent, the electrical energy source in Collins receives electrical energy from the power source (battery) and transmits it to the heating member. *Compare* Ex. 1001, 4:5–7 ("The electrical energy source can essentially be a receptacle that provides for transmission of electrical current from the power source to the heating member."), *with* Ex. 1007, 11:53–12:11, 12:44–45

(describing Figure 10 and electrical connections from terminals 167 to heaters 162 and disclosing that power source 22 delivers energy to heaters).

More specifically, Collins discloses that power source 22 transmits an electric current to heaters 162 via a current path that includes terminals 167, conducting fingers 165 with bends 165A, heater ends 162B, heater ends 162A, conducting fingers 164A, conducting plate 164B, and common terminal 164. Ex. 1007, 7:45–48, 11:53–12:11, Fig. 10; Ex. 1003 ¶ 246 (providing annotation of Collins Figure 10 showing current path). Patent Owner agrees. PO Resp. 53–56. In fact, Patent Owner provides its own circuit diagram illustrating the forward and reverse current paths from Collins' power source 22 to heaters 162, including each of the conductors listed above. *Id.* at 56.

Patent Owner characterizes the structure Petitioner identifies as an "electrical energy source" in Collins as "a group of separate electrical conductors supported by a housing." PO Resp. 50. Patent Owner agrees that this group of conductors is "for supplying current to separate heaters 162." *Id.* at 51. Nevertheless, Patent Owner argues that "the POSA would not consider this structure to be a receptacle because it is not capable of receiving anything." *Id.* We disagree. As discussed above, the electrical energy source that Petitioner identifies in Collins (Pet. 55–56) receives both a physical structure (conductor fingers 165) and electrical power (from power source 22). Ex. 1007, 7:45–48, 11:53–12:11, 12:44–45. Electrical energy cannot possibly be transmitted to the heaters unless it is first received by the conductors of the electrical energy source. In this regard, Collins' electrical energy source functions in the same way as the electrical energy source described in the '915 Patent. Ex. 1001, 4:5–7 (quoted above).

By way of sur-reply, Patent Owner argues that the claim language, "electrical energy source," "dictates that the receptacle must be able to receive and hold (*i.e.*, store) electrical energy." PO Sur-reply 7. As support for that new construction, Patent Owner argues that, if "a mere collection of pins" were sufficient, "the '915 patent would presumably disclose embodiments in which contacts (*e.g.*, contacts 410) passed through the electrical energy source (*e.g.*, electrical energy source 220) and connected directly to the power source." *Id.* at 8 (citing Ex. 1001, Fig. 4; Ex. 2021, 50:12–18). Patent Owner similarly argues that "[t]he '915 patent's electrical energy sources 220 include components (*e.g.*, capacitors) capable of receiving and storing electrical energy." PO Sur-reply 10.

The '915 Patent does not support Patent Owner's construction of "electrical energy source" as something that holds or stores electrical energy. Although Patent Owner contends that "[c]apacitors are capable of storing energy and smoothing waveforms" (PO Resp. 37), the Specification does not support that the electrical energy source requires a capacitor or any other means of holding or storing electrical energy. *See* Ex. 1001, 6:4–8 (disclosing "an electrical power source" that "provide[s] power to the electrical energy source" and "may include one or more batteries and/or at least one capacitor (or other means for providing a stored source of power)"); *id.* at 7:3–5 ("Exemplary power sources can include a battery and/or at least one capacitor."); *id.* at 33:27–31, 33:47–51 (discussing capacitor as part of current regulating circuit); *id.* at 34:50–61 (discussing capacitor as part of power source 275). Claim 3 depends from claim 1 and recites "wherein the electrical energy source includes a capacitor." *Id.* at 42:42–43. Patent Owner agrees that "independent claim 1 is broader than claim 3 and does not require a capacitor." PO Resp. 37.

The testimony of Dr. Deevi that Patent Owner relies upon likewise provides no support for Patent Owner's construction of "electrical energy source" as requiring the capability to hold or store electrical energy. Dr. Deevi testifies that in the '915 Patent, terminals 410 "are plugging into . . . a receptacle, into [an] electrical energy source." Ex. 2021, 50:12–18. Even taken in a light most favorable to Patent Owner, this testimony about one embodiment in the '915 Patent does not support Patent Owner's argument that the '915 Patent unequivocally ***requires*** that the electrical energy source holds or stores electrical energy. We therefore do not construe "electrical energy source" as requiring something that holds or stores electrical energy.

Patent Owner argues that "[t]he alleged 'electrical energy source' of Collins passes current but is not capable of receiving electrical energy." PO Sur-reply 9. We find that Patent Owner's argument is inconsistent with Patent Owner's own description of Collins and logically unsound. Patent Owner does not dispute that the electrical energy source Petitioner identifies in Collins provides a current path from power source 22 to heaters 162, such that "[c]urrent [is] received by the heaters." PO Resp. 54. Before the current is "received by the heaters," it is received by terminals 167 and conductor fingers 165, which precede the heaters in the current path. *Id.*; *see also id.* at 56 (Patent Owner's circuit diagram showing forward and reverse current paths in Collins). We are therefore persuaded that Collins discloses an "electrical energy source" that receives electrical energy.

For these reasons, we find that Petitioner has shown that Collins discloses an "electrical energy source," even if that term is construed as requiring a receptacle.

(2) "Electrical energy source" without Patent Owner's "receptacle" construction

The same evidence as discussed above establishes that Collins discloses an "electrical energy source" under a claim construction that does not require a "receptacle."

Petitioner shows persuasively that Collins discloses an electrical energy source that includes all of the components of the heater assembly shown in Figure 10 except for heaters 162 and base 151. Pet. 55–56. The electrical energy source in Collins includes heater support 155, heater neck 156, heater support arms 161, terminals 167, conductor fingers 165 with bends 165A, conductor fingers 164A, conducting plate 164B, and common terminal 164. *Id.*; Ex. 1007, 11:46–12:11, Fig. 10. There is no dispute that terminals 167 and conductor fingers 165 with bends 165A transmit electrical current from power source 22 to heaters 162 and that conductor fingers 164A, conducting plate 164B, and common terminal 164 transmit electrical current from the heaters back to the power source. PO Resp. 56 (illustrating forward and reverse current paths). This transmission is the same function as the '915 Patent describes for the electrical energy source. Ex. 1001, 4:5–7.

Patent Owner argues that "the POSA would not understand the term 'electrical energy source' to read on a group of separate conductors supported by a housing," as Collins discloses. PO Resp. 57. According to Patent Owner, "Collins' conductors (*e.g.*, terminals 167, bends 165A, conductor fingers 165, etc.) supported by heater support 155 may be referred to as a 'conduit' or 'pin module,' but the POSA would never consider these components to be an 'electrical energy source.'" *Id.* (citing Ex. 2015 ¶ 118). Patent Owner argues that "none of the embodiments of the '915 patent

discloses an 'electrical energy source' that is a mere collection of pins." PO Sur-reply 8.

After considering the parties' arguments and evidence, we are persuaded that Collins discloses an electrical energy source as Petitioner identifies. Pet. 55–56. Patent Owner does not direct us to anything in the '915 Patent or elsewhere in the intrinsic record sufficient to support Patent Owner's argument that a POSA would not have understood the term "electrical energy source" to read on the identified components of Collins' heater assembly. Although Patent Owner argues that the term "electrical energy source" requires "*something more* than a mere collection of pins capable of carrying current" (PO Resp. 36; PO Sur-reply 6), the intrinsic record does not support Patent Owner's attempts to identify "something more."

For instance, Patent Owner argues that an "electrical energy source" must be able to hold or store electrical energy. PO Sur-reply 7–8. That argument is inconsistent with the Specification and claims of the '915 Patent for the reasons discussed above. In addition, Patent Owner argues that the "electrical energy source" in the '915 Patent provides for "switch-operated delivery of electrical energy to the heating member." PO Resp. 8–9, 13; Tr. 31:24–26, 37:13–15. We agree with Petitioner, however, that claim 1 recites a switching component as part of the control unit section, not as part of the electrical energy source. Ex. 1001, 42:22–39; *see* Tr. 56:10–19 (Petitioner's argument). Nothing in the Specification or claims of the '915 Patent suggests that the electrical energy source has switches in it. Patent Owner also asserts that an "electrical energy source" is "most typically going to be some kind of circuit board circuitry." Tr. 37:16–17; *see* PO Resp. 37 (asserting that "electrical energy source" reads on a printed

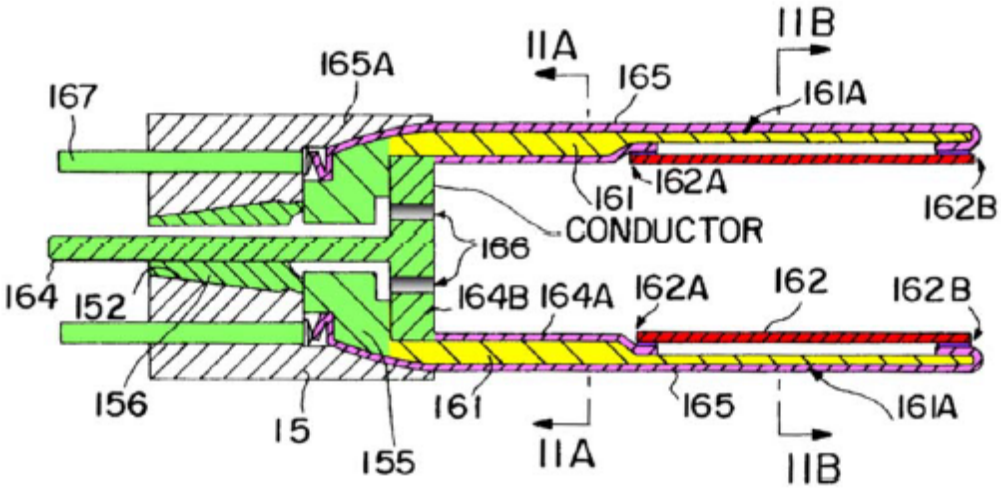
circuit board). Patent Owner does not cite any intrinsic evidence suggesting that an "electrical energy source" could be, much less is required to be, circuit board circuitry.

For these reasons and the reasons provided in the preceding subsection, we find that Petitioner has shown that Collins discloses an "electrical energy source" under a claim construction that does not require a receptacle.

c) Projection

Claim 1 recites that the "electrical energy source" "includes a projection extending outwardly therefrom and that includes a component that forms an electrical connection with electrical contacts on a separate electrical heating member." Ex. 1001, 42:26–30. Claim 1 additionally recites that "the component that forms an electrical connection with the electrical contacts is located on the projection." *Id.* at 42:37–39.

Petitioner identifies a "projection" and a "component" in Collins with reference to the following colored version of Figure 10.



Pet. 57–58. Collins Figure 10 shows a heater unit for a smoking article. With reference its colored version of Figure 10, Petitioner contends that "Collins' electrical energy source includes the claimed projection 161 (yellow) and the component(s) 164A and 165 (pink) that form an electrical connection with heaters 162 (red)." Pet. 57.

Patent Owner argues that Collins' "heater support arms 161 are not a projection of the alleged electrical energy source because they are part of the separate heater fixture that snap fits to mate with the heater base 151 and terminals 167." PO Resp. 61.

After considering the parties' arguments and evidence, we determine that Petitioner shows persuasively that Collins discloses a projection extending outwardly from the electrical energy source, as claimed. We agree with Petitioner that Collins' heater support arms 161 (yellow) are each a "projection extending outwardly" from the rest of the electrical energy source (green), as recited in claim 1 and shown in Petitioner's colored version of Figure 10 reproduced above. Pet. 57; *see* Ex. 1007, 11:47–51, 11:63–65 (describing heater unit 150, including heater support arms 161, as shown in Figure 10).

We find that Collins' heater support arms 161 are each a "projection extending outwardly" from the rest of the electrical energy source, notwithstanding the snap fit connection Collins describes and Patent Owner relies upon as distinguishing Collins from the projections claim 1 recites. Ex. 1007, 12:1–11; PO Resp. 59–65. Patent Owner agrees that "an electrical energy source can be multiple separable parts." PO Resp. 66. Indeed, Patent Owner does not challenge our finding in the Institution Decision that an "electrical energy source" can "comprise multiple components that are

separable from each other." Inst. Dec. 29. The following analysis supports our finding:

> The claims of the '915 Patent recite "an electrical energy source" that includes multiple components—a "projection" and a "component" and possibly also a "capacitor"—without restriction on how they are connected together. Ex. 1001, 42:26–30, 42:42–43 (claims 1 and 3). The Specification likewise discloses a multicomponent electrical energy source. When describing the Figure 9 embodiment, the '915 Patent discloses electrical energy source 220 that provides power to an electrical heating member and includes projection 225 extending therefrom, where electrical leads 222 on the projection make an electrical connection with the electrical heating member. *Id*. at 23:13–18, 23:48–55, 37:25–34, 40:67–41:5, 41:10–14.

Id.

We find that the snap fit connection between Collins' heater base 151 and heater support 155 (Ex. 1007, 12:1–11, Fig. 10) does not rebut Petitioner's showing that heater support arms 161 are each a "projection extending outwardly" from the rest of the electrical energy source. The electrical energy source in Collins includes heater base 151, heater support 155, and heater support arms 161, among other parts. *See* Pet. 55–56. Heater support arms 161 are part of the structure associated with heater support 155 that snap fits into heater base 151. Ex. 1007, 12:1–11, Fig. 10; *see* PO Resp. 65 ("the heater support 155 (and associated structure including heater support arms 161) snap fits into the heater base 151"). Collins Figure 10 shows, and Patent Owner does not dispute, that heater support arms 161 are each a "projection extending outwardly" from heater base 155, which is part of the electrical energy source. Ex. 1007, Fig. 10.

Patent Owner argues that "the POSA would never consider the [heater support] arms 161 to be a projection of the terminals 167." PO Resp. 61

(citing Ex. 2015 ¶ 126); *see also id.* at 63, 65 (same argument). That argument, however, does not undermine the persuasiveness of Petitioner's showing because, as Patent Owner agrees, terminals 167 are ***only part*** of Collins' electrical energy source. *Id.*; *see also* Pet. 55-–56 (Collins' electrical energy source includes all components of heater unit 150 except heaters 162 and base 151). In Collins, the electrical energy source includes heater support 155, and Patent Owner agrees that "the heater support arms 161 could possibly be projections of the heater support 155." PO Resp. 61.

For these reasons, we find that Petitioner has shown that Collins discloses an "electrical energy source" that "includes a projection extending outwardly therefrom," as recited in claim 1.

d) Remaining elements of claim 1

There is no dispute about whether Collins, alone or in combination with Brooks, discloses the remaining elements of claim 1 not specifically discussed above. Nor is there any dispute about whether Petitioner shows that a POSA would have had a reason to combine the cited teachings of Collins and Brooks. We determine that Petitioner shows persuasively that Collins, alone or in combination with Brooks, discloses or suggests the following claim elements.

> A reusable control unit for use with a disposable smoking article, the reusable control unit comprising a control housing including: . . . a control unit section that houses a power source, a switching component that actuates flow of electrical current from the electrical energy source to the electrical heating member, and a flow regulating component that regulates a previously initiated current flow from the electrical energy source to the electrical heating member . . . .

Ex. 1001, 42:22–24, 42:31–37 (claim 1); Pet. 49–50, 64–72. Petitioner also shows persuasively that "a POSA implementing Collins would have been

motivated to use Brook's puff-actuation system." Pet. 68, 71–72; Ex. 1003 ¶¶ 284–288, 300–304.

4. Claim 2

Claim 2 depends from claim 1 and recites "wherein the power source includes a battery." Ex. 1001, 42:40–41. There is no dispute, and we find, that Collins teaches the limitation of claim 2. Ex. 1007, 7:39–41 (disclosing "power source 22, which could include a battery"); *id.* at 12:12–25 (disclosing more details regarding the battery); Pet. 65–66, 73; *see* PO Resp. 32, 52–53, 69–70 (discussing Collins' disclosure of a battery as the power source for the heaters).

5. Claim 3

Claim 3 depends from claim 1 and recites "wherein the electrical energy source includes a capacitor." Ex. 1001, 42:42–43.

Petitioner contends that Collins teaches an electrical energy source including a capacitor via express disclosure and by incorporation and citation of Counts-671[11] for this purpose. Pet. 74 (citing Ex. 1007, 1:20–40, 4:27–40, 7:39–42, 7:45–59; Ex. 1008, 9:25–51, Fig. 9).

Patent Owner argues that Collins' capacitor is part of power source 22, not part of the alleged "electrical energy source." PO Resp. 70–71 (citing Ex. 1007, 7:39–41).

After considering the parties' arguments and evidence, we determine that Petitioner shows persuasively that Collins teaches an electrical energy source including a capacitor, as recited in claim 3. There is no dispute about whether Collins discloses a capacitor, which it plainly does. Ex. 1007,

[11] Ex. 1008, US 5,060,671, issued October 29, 1991 ("Counts-671").

7:39–41 ("Reusable portion 20 includes, at the end remote from the mouth end, a power source 22, which could include a battery, a capacitor or both."). Petitioner shows persuasively that Collins' capacitor is part of an electrical energy source. Pet. 74. More specifically, Petitioner shows that Counts-671 is incorporated by reference in Collins (Ex. 1007, 1:20–40, 4:37–40) and contains the same disclosure as the '915 Patent regarding the function of a capacitor. Pet. 74 (citing Ex. 1001, 34:50–55; Ex. 1008, 9:25–51, Fig. 9).

Like the '915 Patent, Counts-671 teaches that a battery is used to charge a capacitor, which in turn, is rapidly discharged to provide power to the heating elements of a smoking article. Ex. 1001, 34:50–55; Ex. 1008, 9:25–33. According to these disclosures, the capacitor is in a current path between the battery and the heating elements. In this regard, Collins' capacitor is a part of the electrical energy source that supplies electrical energy to the heaters in the same way as the capacitor of the '915 Patent is a part of the electrical energy source that supplies electrical energy to the heaters. *Compare* Ex. 1001, 6:4–8 (disclosing "an electrical power source" that includes "one or more batteries and/or at least one capacitor"), *with* Ex. 1007, 7:39–41 (disclosing "a power source 22, which could include a battery, a capacitor or both"); *see also* PO Reply 24 (Petitioner's annotation of circuit of Figure 9 of Counts-671 identifying electrical energy source including a capacitor).

Claim 3 does not specify the physical location of the capacitor. Claim 1 recites "a receiving end . . . having an electrical energy source." Ex. 1001, 42:25–27. As discussed above, the parties agree that this limitation is satisfied if any portion of the electrical energy source is in the receiving end. PO Resp. 2; Pet. Reply 12. Accordingly, there is no requirement that the portion of the electrical energy source that includes a

capacitor be in the receiving end, as Patent Owner tries to suggest. PO Resp. 71.

Patent Owner argues that the components that Petitioner identifies as the "electrical energy source" do not include a capacitor. PO Resp. 68–69 (citing Pet. 55–56); PO Sur-reply 15–16 (same). The problem with Patent Owner's argument is that it considers only Petitioner's contentions for claim 1, which does not recite a capacitor. When addressing claim 3, Petitioner asserts that "Collins teaches an electrical energy source including a capacitor" and provides support for that contention, including the disclosures of Collins and Counts-671, as compared with the disclosure of the '915 Patent. Pet. 74.

For these reasons, we find that Petitioner has shown that Collins discloses an electrical energy source that includes a capacitor, as recited in claim 3.

6. Claims 4 and 5

Claim 4 depends from claim 1 and recites: "wherein the switching component comprises a puff-actuated switch." Ex. 1001, 42:44–45. Claim 5 depends from claim 1 and recites: "wherein the switching component comprises a pushbutton." *Id.* at 42:46–47. It is undisputed, and we find, that Collins teaches the limitations of claims 4 and 5. Collins discloses: "Power source 22 provides power for heating elements 23, which are energized under the control of control circuit 24, which is in turn preferably actuated by a ***puff-actuated sensor 24A***. In the alternative, control circuit 24 is actuated by ***pushbutton 25***." Ex. 1007, 7:46–50 (emphasis added); *see also id.* at 7:56–59 (referring to Counts-671, which is incorporated by reference, for a more detailed disclosure of puff-actuated

sensor or pushbutton); *id.* at 12:27–31 ("[c]ontrol circuit 24 . . . sequences through the eight (or other number of) heaters 23 to select the next available heater 23 each time puff-actuated sensor 24A is activated"). Pet. 66–67, 74–75.

Counts-671, which is incorporated by reference in Collins, contains essentially the same disclosure of a puff-actuated sensor as the '915 Patent. *Compare* Ex. 1001, 32:26–35 (discussing exemplary puff-actuation mechanism available from Honeywell as Model 163PC01D36), *with* Ex. 1008, 5:16–28 (disclosing the same Honeywell model as a switch that is sensitive either to pressure changes or air flow changes as the consumer draws on the smoking article); *see* Pet. 67–68 (making comparison).

7. Conclusion for Petitioner's Collins-led Ground

The preponderance of the evidence shows that claims 1–5 of the '915 Patent are unpatentable as obvious based on Collins alone or in combination with Brooks.

E. Petitioner's Deevi-led Ground

Because we determine that Petitioner has shown that all challenged claims are unpatentable based on Petitioner's Collins-led ground, we do not reach Petitioner's Deevi-led ground. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding a petitioner "is entitled to a final written decision addressing all of the claims it has challenged"); *Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (nonprecedential) ("We agree that the Board need not address [alternative grounds] that are not necessary to the resolution of the proceeding.").

III. CONCLUSION

In summary:[12]

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–5[13]	103(a)	Deevi, Brooks		
1–5	103(a)	Collins, Brooks	1–5	
Overall Outcome			1–5	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–5 of the '915 Patent are unpatentable; and

FURTHER ORDERED that because this Decision is final, a party to the proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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[12] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding,* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[13] We do not reach Petitioner's Deevi-led ground because we determine that Petitioner has shown that all challenged claims are unpatentable based on Petitioner's Collins-led ground.

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