

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TITEFLEX CORPORATION,
Petitioner,

v.

GOODSON HOLDINGS, LLC,
Patent Owner.

Case IPR2016-00731
Patent 7,821,763 B2

Before KALYAN K. DESHPANDE, JUSTIN T. ARBES, and
KIMBERLY McGRAW, *Administrative Patent Judges*.

McGRAW, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

In this *inter partes* review, instituted pursuant to 35 U.S.C. § 314, Titeflex Corporation (“Petitioner”) challenges the patentability of claims 1–7 of U.S. Patent No. 7,821,763 B2 (Ex. 1001, “the ’763 patent”), owned by Goodson Holdings, LLC. (“Patent Owner”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–7 of the ’763 patent are unpatentable.

A. *Procedural History*

Petitioner filed a Petition requesting an *inter partes* review of claims 1–7 of the ’763 patent. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). On September 9, 2016, we instituted an *inter partes* review of claims 1–7 of the ’763 patent on certain asserted grounds of unpatentability. Paper 8 (“Dec. on Inst.”).

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 11, “PO Resp.”) and Petitioner filed a Reply (Paper 14, “Reply”). A consolidated oral hearing for this proceeding and Case IPR2016-00730, involving the same parties and similar issues, was held on May 10, 2017. A transcript of the consolidated hearing has been entered into the record. Paper 19 (“Tr.”).

B. *Related Proceedings*

The parties state the ’763 patent is asserted in a patent infringement lawsuit filed by Patent Owner against Petitioner in the U.S. District Court

for the Northern District of Texas, Dallas Division, captioned *Goodson Holdings, LLC v. Titeflex Corporation*, Civil Action No. 3:15-cv-2153. Pet. 1; Paper 4, 2. The parties also identify Case IPR2016-00730, in which Petitioner seeks *inter partes* review of U.S. Patent No. 7,562,448 B2 (“the ’448 patent”), as a related matter. Pet. 1; Paper 4, 2.

C. The ’763 Patent

The ’763 patent is a divisional of the ’448 patent and is directed to methods and devices for preventing damage to household gas tubing, such as corrugated stainless steel tubing (“CSST”), from lightning strikes, appliance shorts, or other electrical charge going to ground. Ex. 1001, [62], Abstract, 3:39–44. The ’763 patent explains that the metal components of the gas tubing/pipe “are chosen for their ability to safely carry natural gas” but “have a propensity to fail when exposed to electrical insult, particularly lightning.” *Id.* at 1:46–48, 2:42–45. According to the ’763 patent, there was a need in the art “to have a CSST system” that “is capable of carry[ing] current in the case of electrical arcing or carrying fault currents without suffering perforation or melting at the connector end” and “to have a CSST” that “minimizes the chances of having perforations created on its side walls due to electric injury (i.e. from lightning and similar phenomenon).” *Id.* at 3:17–25.

To address these issues, the ’763 patent discloses a device having a conductive wire that provides a direct electrical contact between the end connectors. *Id.* at Abstract. The conductive ground wire can either be a single wire or multiple strands, such as a wire mesh. *Id.* at 3:37–38. An

embodiment having a single conductive grounding wire is shown in Figure 6A, reproduced below.

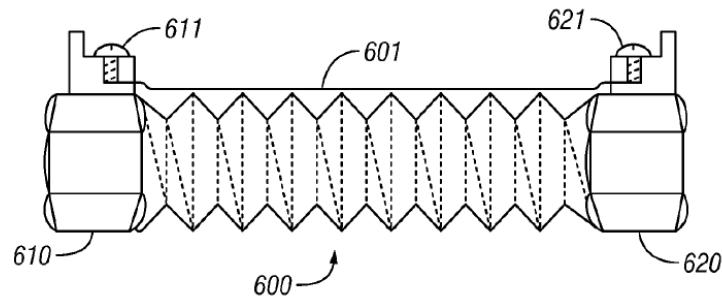


FIG. 6A

Figure 6A illustrates a CSST having a single “copper ground wire 601 of ~#8 American Wire Gauge (AWG) or larger electrically in parallel with the length of CSST or the appliance connectors 610, 620.” *Id.* at 5:9–14. “[G]round wire 601 attaches to . . . end connectors 610, 620 at . . . set screws 611, 621 one on each end.” *Id.* at 5:14–16.

An alternative embodiment having “multiple strands of grounding wire” (e.g., a mesh) is shown below in Figure 6B. *Id.* at 4:7–8, 5:26–27.

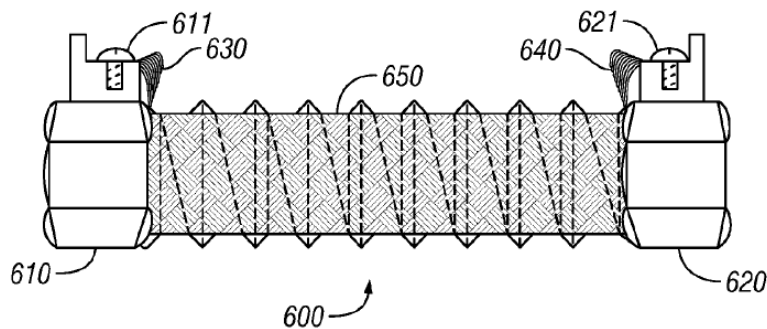


FIG. 6B

Figure 6B shows a CSST with multiple strands of grounding wire. “CSST flex line 600 is shrouded by . . . wire mesh 650, which is attached to

collars 630, 640 on each end.” *Id.* at 5:29–31. The ’763 patent explains that “[i]f an electrical charge goes to ground via the CSST or the appliance connector, such as from a lightning strike or an appliance short, *the majority of the current* is carried by the conductive wire rather than the CSST or appliance connector itself, thus preventing damage to the CSST from the current.” *Id.* at 3:39–44 (emphasis added). The ’763 patent further states that “[w]hen using a mesh type shield, if the CSST or appliance connector receives an electrical charge from arcing to the side walls, the mesh serves as a current shunt and thus both shunts the current and causes the charge on the actual CSST (or appliance connector) wall to be dissipated over a larger area.” *Id.* at 3:44–49.

Both embodiments keep “electrical current from damaging the flared ends of the CSST by providing an electrical shunt in the form of copper ground wire between the brass connectors on the ends.” *Id.* at 5:36–40. Because “copper is a superior conductor to CSST, it can safely carry currents that the CSST was never designed to handle.” *Id.* at 5:40–43.

D. Illustrative Claim

Petitioner challenges independent claim 1 and dependent claims 2–7. Claim 1 is reproduced below.

1. An electrical shunt for gas tubing comprising:
 - (a) connecting means at each end of the gas tubing for coupling the tubing to gas lines and appliances, wherein the connecting means are made of a conductive material that has a higher conductivity than the gas tubing; and
 - (b) conducting means for providing direct electrical contact between said connecting means at either end of the gas

tubing, wherein the conducting means has a higher conductivity than the gas tubing and carries electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing.

E. Instituted Grounds of Unpatentability

We instituted *inter partes* review based upon the following asserted grounds of unpatentability:

References	Basis	Challenged Claim(s)
Yamane ¹ and Design Guide ²	§ 103	1–5 and 7
Yamane, Design Guide, and Ohki ³	§ 103	6
Ohki and Design Guide	§ 103	1–4, 6, and 7
Rivest, ⁴ Yamane, and the Design Guide	§ 103	1–4 and 7
Rivest, Ohki, and the Design Guide	§ 103	1–4, 6, and 7

Dec. on Inst. 29.

¹ Japanese Unexamined Patent Application No. 2003-83482, published March 19, 2003 (Ex. 1019) (“Yamane”).

² Excerpts from Titeflex Corp., Gastite Division, GASTITE SYSTEM DESIGN AND INSTALLATION GUIDE (Jan. 2004) (Ex. 1021) (“Design Guide”). We cite to Exhibit 1021 throughout this Decision. Per our instruction, Dec. on Inst. 13 n.7, 29, Petitioner filed a complete copy of the Design Guide as Exhibit 1028.

³ Japanese Unexamined Patent Application No. 2002-174374, published June 21, 2002 (Ex. 1020) (“Ohki”).

⁴ U.S. Patent No. 7,044,167 B2, filed April 7, 2004, issued May 16, 2006 (Ex. 1006) (“Rivest”).

II. DISCUSSION

A. *Principles of Law*

To prevail in challenging Patent Owner's claims, Petitioner must demonstrate by a preponderance of the evidence that the claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is unpatentable under 35 U.S.C. § 103(a) 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 of the invention to a person having ordinary skill in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of 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) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The level of ordinary skill in the art may be reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995).

B. *Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016). There is a “heavy presumption” that a claim term carries its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). However, a

“claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *Id.* “Although an inventor is indeed free to define the specific terms used to describe his or her invention, this must be done with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Also, we must be careful not to read a particular embodiment appearing in the written description into the claim if the claim language is broader than the embodiment. *See In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993) (“[L]imitations are not to be read into the claims from the specification.”).

Construing a “means-plus-function limitation” under 35 U.S.C. § 112, sixth paragraph,⁵ involves two steps: first identifying the function explicitly recited in the claim, and then identifying the corresponding structure set forth in the written description that performs the particular function set forth in the claim. *Golight Inc. v. Wal-Mart Stores Inc.*, 355 F.3d 1327, 1333–34 (Fed. Cir. 2004). Under the second step, “structure disclosed in the specification is corresponding structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim.” *Id.* (citations and quotation marks omitted).

We construe the claim language below in accordance with these principles and to the extent necessary to resolve the controversy. No other

⁵ The Leahy–Smith America Invents Act, Pub. L. No. 112–29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 112. Because the ’763 patent has an effective filing date before the effective date of the applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 112.

terms require express construction. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (stating “only those terms need be construed that in controversy and only to the extent necessary to resolve the controversy”).

1. “*connecting means*”

Claim 1, element (a) recites “connecting means at each end of the gas tubing for coupling the tubing to gas lines and appliances, wherein the connecting means are made of a conductive material that has a higher conductivity than the gas tubing.” Ex. 1001, 6:25–28 (hereinafter “the connecting means”). Petitioner argues that the “connecting means at each end of the gas tubing for coupling the tubing to gas lines and appliances” of independent claim 1 is a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph, whose corresponding structure in the specification of the '763 patent is “end connectors for corrugated gas tubing.” Pet. 10. Patent Owner does not provide an interpretation for the phrase.

The “connecting means” is a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph, because the claim uses the word “means,” describes the function performed by the “means,” and recites no structure for performing the function.

The function of the means-plus-function limitation is defined in claim 1 as “coupling the tubing to gas lines and appliances.” The clauses “at each end of the gas tubing” and “wherein the connecting means are made of a conductive material that has a higher conductivity than the gas tubing” do not modify the coupling function, but indicate that the “connection means” comprises at least two physical structures. The specification of the

'763 patent clearly links “connectors,” “conductive connectors,” and “end connectors” to the function of “coupling the tubing to gas lines and appliances.” See, e.g., Ex. 1001, Abstract (“Connectors for coupling the gas tubing to gas lines and appliances are affixed at each end of the tubing”), 3:32–35 (“Connectors for coupling the CSST . . . to gas lines and appliance[s] are affixed at each end of the tubing. These connectors are made of a conductive material, such as brass.”), 5:14–16 (stating the “ground wire [] attaches to the end connectors 610, 620 at the set screws [], one on each end”), 5:36–40 (“brass connectors on the ends”), Figs. 1–2. In our Decision on Institution, we interpreted “connecting means at each end of the gas tubing for coupling the tubing to gas lines and appliances” in claim 1 as follows:

Function: coupling the tubing to gas lines and appliances.

Corresponding structure: end connectors 610 and 620.

Neither party disputes our construction of the connecting means.

Based on the full trial record, we do not perceive any reason or evidence that compels any deviation from our construction.

2. “conducting means”

Claim 1, element (b) recites “conducting means for providing direct electrical contact between said connecting means at either end of the gas tubing, wherein the conducting means has a higher conductivity than the gas tubing and carries electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing.” Ex. 1001, 6:29–36 (hereinafter “the conducting means”).

In our Decision on Institution, we construed the conducting means as a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph, as follows:

Functions: providing direct electrical contact between the connecting means at either end of the gas tubing and carrying electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing.

Corresponding structure: wire 601 or mesh 650.⁶

Dec. on Inst. 9. Based on the record presented, we disagreed with Patent Owner’s argument in its Preliminary Response that “conducting means” does not encompass a configuration in which “the ground wire touch[es] and [is] in electrical contact with the CSST tubing surface, or potentially such contact resulting from lightning piercing a laminated resin layer, as disclosed by *Yamane* and/or *Ohki*.” Prelim. Resp. 8; *see* Dec. on Inst. 10. We urged the parties to address the meaning of the “conducting means” during trial

⁶ In its Petition, Petitioner asserts that the conducting means also includes screws 611 and 621 as shown in Figures 6A or screws and collars as shown in Figure 6B. Pet. 11–12; Ex. 1028 ¶¶ 67–69 (asserting the ’763 patent states “with regard to the ground wire embodiment of Figure 6A, that ‘[t]his ground wire 601 attaches to the end connectors 610, 620 at the set screws 611, 612, one on each end’”). In our Decision on Institution, we did not construe the corresponding structure of the “conducting means” as encompassing screws 611 and 621. Dec. on Inst. 10 n. 7; *see also* Ex. 1001, Abstract, 3:35–37 (stating that the *conductive wire* makes the direct electrical contact between the end connectors). Neither party addresses this aspect of our construction. Based on the full trial record, we do not perceive any reason or evidence that compels any deviation from our interpretation as to this aspect of the conducting means.

and stated that our ultimate interpretation will be based on the complete record at the end of trial. Dec. on Inst. 10.

In its Response, Patent Owner agrees that the structure described in the '763 patent for performing the function of the conducting means is ground wire 601 shown in Figure 6A and mesh 650 shown in Figure 6B. PO Resp. 16, 20. However, Patent Owner contends that under the broadest reasonable interpretation, the “conducting means” cannot “contact[] the metal surface of the CSST because such would not represent a ‘direct’ electrical connection ‘in parallel’ with the length of the CSST.” *Id.* at 13. Patent Owner frames the claim construction issue as

whether the configuration disclosing the ground wire touching and in electrical contact with the CSST tubing surface, or potentially such contact resulting from lightning piercing a resin layer, as disclosed by *Yamane* and/or *Ohki*, is such a “parallel” configuration representing an electrical “shunt”, or is instead effectively an electrical “short”. The proper construction is that a structure that requires a parallel configuration does *not* include such an electrical short.

Id. at 14–15.

Patent Owner also argues that under the broadest reasonable interpretation of the “conducting means,” the conducting means cannot be in “close electrical contact” to the gas tubing and the conducting means cannot be separated from the inner gas tubing by a resin layer. *See, e.g., id.* at 1 (stating the '763 patent discloses use of a “‘shunt’ that would not be in close electrical contact with the surface of the tubing (i.e., ‘touching’), even in a failure mode”), 32–33 (describing the resin layers in *Yamane* and *Ohki* as a

“design flaw” and stating that the structures shown in the ’763 patent “do not employ a resin”).

To support its claim construction, Patent Owner contends that the structures of Figures 6A and 6B are described as being “in ‘parallel’ with the CSST tubing,” as “provid[ing] a ‘direct’ connection between the ends of the length of the CSST tubing,” and as a “shunt. *Id.* at 18–19 (citing Ex. 1001, 5:36–43). Patent Owner contends that these structures are “superior” to the solutions proposed in Yamane and Ohki, which are not “parallel” configurations and “are not a true shunt.” *Id.* at 9, 18. Specifically, Patent Owner contends that in certain situations, electric charge can be disbursed onto the surface of Yamane’s and Ohki’s CSSTs following a lighting strike or other electrical insult. *Id.* at 28–29 (stating that if “the insulation layer [of Yamane] is pierced by the electrical insult, . . . the charge is dispersed in part onto the surface of the CSST tube”), 30 (stating “similar to *Yamane*, *Ohki* also describes . . . that in the event of an electrical insult piercing element 3 (or element 4 if present), charge will be disbursed over the surface of the CSST tubing”) (citing Ex. 1019 ¶ 24; Ex. 1020 ¶ 31).

Petitioner responds, *inter alia*, that the conducting means does not include “no touching,” “no close contact,” or “no resin” limitations, and that “it is improper, when construing a means-plus-function claim, to import functional limitations that are not recited in the claim, or structural limitations from the written description that are *unnecessary to perform the claimed function*.” Reply 4–12 (quotation omitted). Petitioner also argues that the ’763 patent describes the mesh as “a current shunt” that “both shunts the current and causes the charge on the actual CSST . . . wall to be

dissipated over a larger area.” *Id.* at 7 (quoting Ex. 1001, 3:45–49) (emphases omitted). Petitioner argues that this passage in the specification “expressly contemplates current transferring from the conducting means (i.e., mesh) to the CSST wall, which confirms that the conducting means and CSST can be in contact.” *Id.* at 5–6.

Analysis

The “conducting means” of claim 1 is a means-plus-function limitation under 35 U.S.C. § 112, sixth paragraph, because the claim uses the word “means,” describes the functions performed by the means, and recites no structure for performing the functions.

The functions of the conducting means are defined in claim 1 as “providing direct electrical contact between said connecting means at either end of the gas tubing” and “carr[ying] electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing.” The clause “wherein the conducting means has a higher conductivity than the gas tubing” requires the structure of the conducting means to have a higher conductivity than the gas tubing.

The specification clearly links “copper ground wire 601” and “wire mesh 650” to the functions of providing direct electrical contact between the connecting means at either end of the gas tubing and carrying electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing. *See, e.g.*, Ex. 1001, Abstract (stating the “[c]onductive wire (i.e. mesh surrounding the gas tubing) provides a direct

electrical contact between the end connectors”), 3:39–44 (“If an electrical charge goes to ground via the CSST or the appliance connector, such as from a lightning strike or an appliance short, the majority of the current is carried by the conductive wire rather than the CSST or appliance connector itself, thus preventing damage to the CSST from the current.”), 3:44–49 (“When using a mesh type shield, if the CSST or appliance connector receives an electrical charge from arcing to the side walls, the mesh serves as a current shunt and thus both shunts the current and causes the charge on the actual CSST (or appliance connector) wall to be dissipated over a larger area.”), 3:35–37 (“Conductive ground wire, such as #8 AWG copper, provides a direct electrical contact between the end connectors.”), 5:10–15 (stating “[t]he present invention reduces the risk of . . . failures . . . by placing . . . copper ground wire 601 of ~#8 American Wire Gauge (AWG) or larger electrically in parallel with the length of CSST or the appliance connectors 610, 620”), 5:29–31 (stating “CSST flex line 600 is shrouded by . . . wire mesh 650, which is attached to . . . collars 630, 640 on each end”), 5:36–42 (stating the embodiments of Figures 6A and 6B “keep[] electrical current from damaging the flared ends of the CSST by providing an electrical shunt in the form of copper ground wire between the brass connectors on the ends” and that “[s]ince copper is a superior conductor to CSST, it can safely carry currents that the CSST was never designed to handle”).

Based on the full record, applying the broadest reasonable interpretation of the claims in light of the specification, we construe the “conducting means” of claim 1 as:

Functions: providing direct electrical contact between the connecting means at either end of the gas tubing and carrying electrical current between the connecting means in the event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing.

Corresponding structure: wire 601 or mesh 650.

We do not agree with Patent Owner that the conducting means, when given its broadest reasonable interpretation, prohibits the wire or mesh from touching or being in electrical contact with the CSST tubing surface. *See, e.g.,* PO Resp. 1 (stating Yamane’s and Ohki’s teaching that “excess charge is distributed over the surface of the tubing in a failure mode . . . in no way teaches or suggests the . . . ‘conducting means’ in claim 1(b)”), 13–14 (stating the “proper construction of ‘conducting means’ therefore requires that the ground wire or mesh structure not be in direct electrical contact with the CSST tubing, but rather be in a parallel configuration”), 19–20 (stating that a touching configuration would not distribute charge over CSST tubing).

Patent Owner’s reading of the conducting means as a “shunt” that would not distribute charge over CSST tubing is inconsistent with the specification of the ’763 patent. The ’763 patent expressly states that should the gas tubing receive “an electrical charge from arcing to the side walls, the mesh serves as a current shunt and thus *both* shunts the current and *causes the charge on the actual CSST (or appliance connector) wall to be dissipated over a larger area.*” Ex. 1001, 3:45–49 (emphasis added).

As noted above, the function of the conducting means is to provide direct electrical contact between the connecting means at either end of the gas tubing and carry electrical current between the connecting means in the

event of electrical arcing and ground faults, thereby keeping the current off the gas tubing and preventing damage to the tubing. A copper wire directly connected to brass connectors provides direct electrical contact between the end connectors. The specification of the '763 patent explains that each of the disclosed embodiments “keeps electrical current from damaging . . . the CSST by providing an electrical shunt in the form of copper ground wire between the brass connectors.” *Id.* at 5:36–40. The specification of the '763 patent further explains that because “copper is a superior conductor to CSST, it can safely carry currents that the CSST was never designed to handle.” *Id.* at 5:40–42.

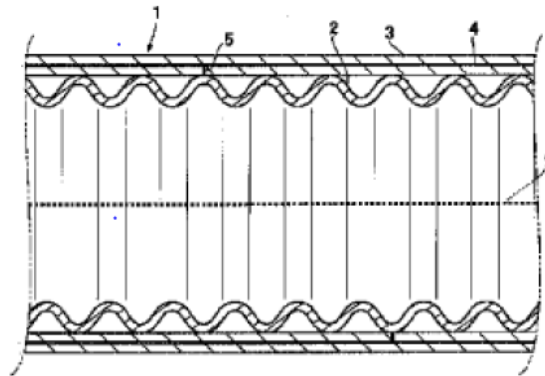
We also do not agree that under the broadest reasonable interpretation, the conducting means cannot be in “close electrical contact” to the gas tubing, or that the conducting means cannot be separated from the inner gas tubing by a resin layer. The claims do not recite any such limitations, and Patent Owner does not identify any statements in the '763 patent specification that describe the structures corresponding to the conducting means as having these characteristics, or otherwise limit the scope of the claims to include these limitations. Patent Owner also does not explain what “close electrical contact” means or provide any definition by which it could be determined whether the distance between components is or is not “close.” Indeed, the conductive wires shown in Figures 6A and 6B of the '763 patent appear to be in “close electrical contact” with the CSST, and Patent Owner does not provide any explanation otherwise. *See, e.g.*, Ex. 1001, Fig. 6A, 6B.

*C. Obviousness of Claims 1–5 and 7 over
Yamane and the Design Guide*

Petitioner asserts claims 1 through 5 and 7 of the '763 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Yamane in combination with the Design Guide, relying on declaration testimony of Vladimir A. Rakov, Ph.D. Pet. 23–38 (citing Ex. 1028). Patent Owner opposes, relying on declaration testimony of David J. Icove, Ph.D. PO Resp. 26–35 (citing Ex. 2001). Having considered the parties' contentions and supporting evidence, we determine that Petitioner has shown by a preponderance of the evidence that claims 1 through 5 and 7 are unpatentable under 35 U.S.C. § 103 over Yamane and the Design Guide.

1. Yamane

Yamane, entitled "Lightning-Proof Tubing," describes various embodiments of covered corrugated stainless steel tubing "capable of withstanding a discharge during a lightning strike without damage to the tube body." Ex. 1019, Abstract, ¶¶ 2, 7, 21. To prevent damage to the tube body from lightning strikes, Yamane teaches covering tube body 2 with insulating cover layer 3 that has a wire or band shaped conductive member 4 integrated in the cover layer. *Id.* ¶¶ 5, 20. Figure 1 of Yamane is reproduced below.



[FIG. 1]

Figure 1 of Yamane depicts a lightning-proof tubing comprising tube body 2, insulating cover layer 3 that covers the outer peripheral region of tube body 2, and wire- or band-shaped conductive members 4. *Id.* ¶ 20. In one embodiment, conductive members 4 are located in the interior of, or the outer face of, the insulating cover layer, but are connected directly to the connecting joint. *Id.* ¶¶ 10, 22. Yamane explains that even if the insulating cover layer is damaged by a lightning strike, most of the lightning current “is guided from the conductive member, through the connecting joint, and then through the electroconductive equipment to the ground, and energy does not concentrate at one point in the tube body, so there is virtually no effect on the tube body.” *Id.* ¶¶ 24, 36. In another embodiment, conductors 5 electrically connect the conductive members to the tube. *Id.* ¶¶ 11, 22. Yamane also states that insulating cover layer 3 may be a resin. *Id.* ¶ 28 (stating that “[i]f the insulating cover layer 3 is constituted by a resin material, this reinforces . . . tube body 2 and makes it more bendable”); *see also* claim 4 (dependent claim limiting the insulating cover layer to be “constituted by a resin material”).

2. Design Guide

The Design Guide is a document that provides a “user with general guidance when designing and installing fuel gas piping using Gastite® Flexible Gas Piping.” Ex. 1021, 1. Relying upon the declaration testimony of Mark Harris (Ex. 1024), Petitioner contends that the Design Guide was published in January 2004 and qualifies as prior art under § 102(b). Pet. 25.

In our Decision on Institution, we found that Petitioner made a threshold showing that the Design Guide is a prior art printed publication under § 102(b). Patent Owner does not argue in its Response that the Design Guide is not a printed publication. See PO Resp. After considering the evidence and argument on the full record, we find the Design Guide qualifies a prior art printed publication under § 102(b).

Petitioner has shown that the Design Guide was sufficiently accessible to the public interested in the art more than one year before July 18, 2005, the filing date of the ’448 patent, to which the ’763 patent claims priority. See *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989) (stating that to qualify as a printed publication, a document must have been sufficiently accessible to the public interested in the art before the critical date); Ex. 1001, [62]. “A reference is publicly accessible ‘upon a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.’” *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1350–51 (Fed. Cir. 2008). Mr. Harris, business development manager for the Gastite Division of Petitioner, testifies that Exhibit 1021 is a “true and correct copy of excerpts

from the January 2004 Gastite Design and Installation Guide,” that the complete Design Guide “was published and made available to the public during or before January 2004 through Gastite’s website, www.gastite.com, through Gastite’s distributors, through Gastite’s certification and training programs, and directly from Gastite upon request.” Ex. 1026 ¶ 2. For these reasons, we determine that the Design Guide qualifies as a printed publication.

The Design Guide provides instructions for the installation and grounding of corrugated stainless steel tubing using the Gastite Flexible Gas Piping system, which uses CSST flexible gas piping to supply gas or liquefied petroleum to appliances. Ex. 1021, 2–4. The Design Guide explains that the CSST gas supply system should be bonded to ground, stating “each above ground portion of a gas piping system which is likely to become energized shall be electrically continuous and bonded to a designed, permanent, low impedance effective ground fault current path.” *Id.* at 63. The “tubing is connected using special mechanical brass fittings.” *Id.* at 3, 5 (“Straight Fittings connect the flexible gas piping to gas supply, distribution manifolds or gas appliances.”), 46, 91 (stating the “Fitting adapter, bushings and nut” and “Mechanical Joint Fitting” are made of “CA360 Brass”), Fig. 4–31 (illustration of corrugated tubing with connectors on both ends).

3. Level of Ordinary Skill in the Art

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented 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, 550 U.S. at 406 (quoting 35 U.S.C. § 103(a)). Petitioner argues that a person of ordinary skill in the art “would have been familiar with basic concepts of lightning-protection,” and such familiarity would have come from “an undergraduate degree in electrical engineering or [a] comparable subject,” or “one to three years of practical work experience designing and installing lightning-protection systems.” Pet. 10 (citing Ex. 1028 ¶¶ 56–57). Patent Owner does not propose a different level of ordinary skill in its Response. Based on our review of the ’763 patent, the types of problems and solutions described in the ’763 patent and cited prior art, and the testimony of the parties’ declarants, we agree with Petitioner’s assessment of the level of ordinary skill in the art.

4. Claim 1

Claim 1 is generally directed to an “electrical shunt for gas tubing comprising” “connecting means” and “conducting means.” Petitioner explains how the combination of Yamane and the Design Guide teaches each of the limitations of claim 1. Pet. 23–35 (stating that to the extent certain details about CSST gas tubing are not explicitly disclosed in Yamane, such details were well known to one of ordinary skill in the art and also are disclosed in the Design Guide). Petitioner contends that Yamane’s “conductive members” “act as an electrical shunt, keeping current off the inner gas tubing,” as recited in the preamble of claim 1. *Id.* at 24–25 (citing Ex. 1019 ¶¶ 3–4, 18, 36); Ex. 1028 ¶¶ 114–115. Relying on the testimony of Dr. Rakov, Petitioner argues that one of ordinary skill in the art would understand that the lightning-proof tubing of Yamane has end connectors (i.e., connecting means) “affixed at each end of the gas tubing for coupling

the tubing to gas lines and appliances,” as recited in claim 1, element (a). *Id.* at 25–26 (citing Ex. 1028 ¶¶ 107, 118–119; Ex. 1019 ¶¶ 18, 21; Ex. 1024, 76; Ex. 1021, 4, 5, 46, 63, Fig. 4–31). Petitioner also contends that it would have been obvious to one of ordinary skill in the art based on the Design Guide to use end connectors made of brass, “a conductive material that has a higher conductivity than the gas tubing” of Yamane. *Id.* at 26–28 (citing Ex. 1028 ¶¶ 125–127; Ex. 1001, 4:52–56; Ex. 1021, 3, 5, 91); *see also* Ex. 1028 ¶¶ 125–128 (explaining that Yamane’s description that “most” of the current is guided “through the connecting joint” to ground suggests that the connecting joint is made of more highly conductive material than the gas tubing). Patent Owner does not dispute that Yamane teaches an electrical shunt for gas tubing or the connecting means of claim 1(a). Based on the evidence of record, we agree with Petitioner that Yamane teaches end connector or connecting joints that are the same as, or equivalent to, connectors 610 and 620 in the specification of the ’763 patent.

Petitioner contends that Yamane’s “conductive member 4” or “conductive wire” teaches the conducting means recited in claim 1(b). Pet. 28–32. Petitioner contends that Yamane’s conductive wire, which can be “connected directly to the connecting joint,” provides “direct electrical contact” between connecting joints (i.e., connecting means) at either end of the gas tubing because the conductive wire “is integrally provided in [an] insulating cover layer over the longitudinal region of the tubing [that] can be electrically connected to the electroconductive equipment.” *Id.* at 29–30 (quoting Ex. 1019 ¶¶ 5, 20; citing *id.*, claim 6; Ex. 1028 ¶ 133) (emphases omitted). Petitioner further contends that the Yamane device “would not

work if there were no direct electrical contact between the end connectors.” *Id.* at 30; Ex. 1028 ¶¶ 134–135; Ex. 1019 ¶¶ 24, 36. Relying on the testimony of Dr. Rakov, Petitioner also contends that Yamane’s conductive wire has a “higher conductivity than the gas tubing” as required by claim 1 because Yamane states that “most of the lightning current produced by a discharge from a lightning strike” is “guided from the conductive members, through the connecting joint, and then through the electroconductive equipment to the ground.” Pet. 32 (citing Ex. 1019 ¶ 36; Ex. 1028 ¶¶ 143–144) (emphasis omitted).

Petitioner contends that the conducting wire of Yamane “carries a sufficient amount of the electrical current to ground so as to prevent damage to the inner tubing from the electrical current.” *Id.* at 33. Specifically, Petitioner points to Yamane’s disclosure that

most of the lightning current produced by a discharge during a lightning strike is guided from the conductive member, through the connecting joint, and then through the electroconductive equipment to the ground, and energy does not concentrate at one point in the tube body, so there is virtually no effect on the tube body.

Id. (quoting Ex. 1019 ¶ 36) (emphases omitted).

We find that the combination of Yamane and the Design Guide teaches a conducting wire that performs the recited functions and is the same as, or equivalent to, wire 601 in the specification of the ’763 patent.

Petitioner has shown that the combination of Yamane and the Design Guide teaches all of the limitations of claim 1, and has articulated sufficient reasoning why a person of ordinary skill in the art would have combined the teachings of the references. For the reasons explained below, we are not

persuaded by Patent Owner's arguments to the contrary. *See, e.g.*, PO Resp. 31–34. Patent Owner's arguments are mainly premised on its proposed interpretation of the conducting means of claim 1, with which we disagree for the reasons explained above. *See supra* Section II.B.2. Further, even if the conducting means of claim 1 could not touch or must be in close contact with the gas tubing, or cannot have a resin layer, as Patent Owner contends, we are persuaded that Yamane teaches the conducting means of claim 1 for the reasons explained below.

Patent Owner first argues that Yamane “does not teach or suggest the structure or its equivalent for a ‘conducting means’ of claim 1(b)” because Yamane does not teach “a ground wire not touching the surface of the CSST tubing, thereby creating an electrical path ‘in parallel’ with the surface of the CSST tubing which ‘directly’ connects the end connectors on either side of the CSST tubing run to create the electrical shunt.” PO Resp. 34. Patent Owner contends that the “only conducting structures disclosed by *Yamane* . . . have the shunt wire in close electrical contact with the surface of the CSST tubing (*Yamane*, Fig. 1–Fig. 4, and conducting elements 5 or 8, Ex. 1019),” and that having “grounding wires in electrical contact or other close contact with the surface of the CSST tubing defeats the purpose stated in claim 1 of the ’763 patent that the structure is: ‘thereby keeping the current off the gas tubing’.” *Id.* at 4.

These arguments are not persuasive. Yamane's conductive member 4, which is connected to end connectors, may be on the outer face of the insulating cover layer, in which case the conductive wire would not touch the surface of the CSST tubing and would create an electrical path in parallel

with the surface of the CSST tubing. *See, e.g.*, Ex. 1019 ¶¶ 5, 10; Ex. 1028 ¶ 153; Reply 13–16. Yamane teaches a “lightning-proof tubing that can be electrically connected to a piece of electroconductive equipment, wherein the outer peripheral region of a tube body . . . is covered with an insulating cover layer.” Ex. 1019 ¶ 5. A “wire- or band- shaped conductive member that is integrally provided in said insulating cover layer over the longitudinal region of the tubing can be electrically connected to the electroconductive equipment.” *Id.*; *see also id.* ¶ 20 (stating “conductive members 4 [are] located in the interior of . . . insulating cover layer 3” or “they may be provided in the inner face or the outer face of the insulating cover layer 3”). The conducting elements (e.g., conductor 5), which electrically connect the tube body and the conductive member, are not required if the conducting wire provided in the insulating cover is electrically connected to a connecting joint. *See id.* ¶ 29 (stating if “conductive members 4 integrally provided in . . . insulating cover layer 3 are electrically connected to . . . tube body 2 by a connecting joint, this allows lightning current to be conducted and dispersed to . . . tube body 2 *without the need for a separate conduction means*”) (emphasis added). Therefore, we agree with Dr. Rakov’s testimony that if Yamane’s conductive wire were “in the interior of the insulating cover layer” or on “the outer face of the insulating cover layer,” it would be electrically isolated from (i.e., not in direct electrical contact with) the inner metal tubing. Ex. 1028 ¶ 153.

Additionally, Yamane states that the purpose of the conductive wire is to keep current off the gas tubing and prevent damage to tubing. Specifically, Yamane states that

most of the lightning current produced by a discharge during a lightning strike is guided from the conductive member, through the connecting joint, and then through the electroconductive equipment to the ground, and energy does not concentrate at one point in the tube body, so there is virtually no effect on the tube body.

Ex. 1019 ¶ 36 (emphases added). This is similar to the disclosure of the '763 patent, which states:

If an electrical charge goes to ground via the CSST or the appliance connector, such as from a lightning strike or an appliance short, *the majority of the current is carried by the conductive wire rather than the CSST or appliance connector itself, thus preventing damage to the CSST from the current.*

Ex. 1001, 3:39–44 (emphasis added).

Patent Owner also argues that “the configuration of the conducting layer and insulating layer shown in *Yamane* . . . is purposefully designed to ‘short’ the conducting layer by physically connecting the conducting layer with the surface of the CSST or, alternatively, creating such a connection by the electrical insult (i.e. lightning) piercing the resin laminate.” PO Resp. 5. Patent Owner contends that this is the “exact opposite of a ‘parallel’ connection as claimed in the '763 Patent.” *Id.*

This argument is not persuasive. As discussed above, *Yamane* describes an embodiment in which the conducting layer is not in direct electrical contact with the surface of the CSST. Additionally, Patent Owner admits that at least some of the time, the insulating layer of *Yamane* would not fail following a lightning strike. Tr. 40:22–41:11 (agreeing that “at least some portion of the time *Yamane*/Ohki may work”). As a result, at least some of the time, the conductive wire of *Yamane* will not touch, or be in

electrical contact with, the CSST following a lightning strike or other electrical insult. This is made clear by Yamane’s statement that “*even if* the insulating cover layer . . . were to be damaged by a discharge during a lightning strike,” thereby indicating that in some instances, the insulating cover would not be damaged by a lightning strike. Ex. 1019 ¶ 37.

Therefore, the record does not support Patent Owner’s argument that the conducting wire of Yamane does not provide direct electrical contact between the connectors. We agree with Petitioner that Yamane’s conductive wire is the same as, or equivalent to, wire 601 in the specification of the ’763 patent.

Patent Owner also attempts to distinguish claim 1 from Yamane by stating that Yamane’s resin layer is a “design flaw” that could lead to fire as a result of lightning piercing the resin layer and allowing the creation of an electrical connection between the conducting layer and the surface of the CSST, and “[s]uch flaws are not present in the structures of Fig. 6A and Fig. 6B of the ’763 Patent.” PO Resp. 1–2, 9, 32 (citing Ex. 2001 ¶¶ 123–128, 160–163).

This argument is not persuasive for a number of reasons. First, Yamane does not require that the insulating cover layer be a resin layer. *See, e.g.*, Ex. 1019 ¶ 28 (stating that “[*i*]*f* the insulating cover layer 3 is constituted by a resin material, this reinforces . . . tube body 2 and makes it more bendable” (emphasis added)); *see also id.*, claim 4 (dependent claim limiting the insulating cover layer to be “constituted by a resin material”). Second, claim 1 does not exclude the use of a resin layer. *See supra* Section II.B. Third, conductive wire 4 of Yamane performs the functions of the

conducting means of claim 1(b), even if the insulating cover layer were comprised of a resin. Yamane states

Although the insulating cover layer, . . . may be damaged by a discharge during a lightning strike, *most of the lightning current produced by a discharge during a lightning strike is guided from the conductive member, through the connecting joint, and then through the electroconductive equipment to the ground, and energy does not concentrate at one point in the tube body, so there is virtually no effect on the tube body.*

Ex. 1019 ¶ 36 (emphasis added). Both the conductive member of Yamane and the conducting wire of the '763 patent are designed to provide a more conductive path so that most of the current produced by a lightning strike will travel over the conductive pathway and not damage the CSST. *See, e.g.,* Ex. 1019 ¶ 36; Ex. 1001, 3:35–44.

Patent Owner's proffered evidence and argument that Yamane's conductive wire, even if coated by a resin, functions differently and cannot be considered equivalent structure to wire 601 of the '763 patent are not persuasive. None of the evidence proffered by Patent Owner to show that the structures of Yamane (or Ohki)⁷ function differently than the wire or mesh structures of the '763 patent relates to a CSST tubing having a conductive wire or mesh of the type described in Yamane (or Ohki). Citing Dr. Icové's testimony, Patent Owner contends that "configurations similar to those disclosed by *Yamane* and *Ohki* burst[] into flames when tested in

⁷ Patent Owner presents similar arguments as to why the structure of Ohki functions differently than the structure of the '763 patent. *See, e.g.,* PO Resp. 4–5, 14, 18, 20, 26–33.

laboratory conditions.” PO Resp. 5 (citing Ex. 2039; Ex. 2002, 11); *see* Ex. 1001 ¶ 135. However, Patent Owner admitted that Dr. Icove’s testimony is not based on a structure having a conductive wire as taught by Yamane (or mesh taught by Ohki), but instead is based on embodiments that only have a resin layer covering the CSST. Tr. 44:14–45:11. Similarly, cited Exhibit 2002 does not discuss a structure having a conductive wire.

Accordingly, we are persuaded that Yamane and the Design Guide teach all of the limitations of claim 1, and that a person of ordinary skill in the art would have had reason to combine their teachings to achieve the recited electrical shunt.

As part of our obviousness analysis, we consider the evidence and arguments submitted by Patent Owner regarding secondary considerations of nonobviousness. *See Graham*, 383 U.S. at 17–18.

5. Secondary Considerations

Factual inquiries for an obviousness determination include secondary considerations based on evaluation and crediting of objective evidence of nonobviousness. *Graham*, 383 U.S. at 17–18. Notwithstanding what the teachings of the prior art would have suggested to one with ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of nonobviousness, may lead to a conclusion that the challenged claims would not have been obvious to one with ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984). Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and industry praise. *See Graham*, 383 U.S. at 17;

Leapfrog Enters., Inc. v. Fisher–Price, Inc., 485 F.3d 1157, 1162 (Fed. Cir. 2007).

To be relevant, evidence of nonobviousness must be commensurate in scope with the claimed invention. *In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011). The proponent of secondary considerations evidence “must establish a nexus between the evidence and the merits of the claimed invention.”

Rambus Inc. v. Rea, 731 F.3d 1248, 1256 (Fed. Cir. 2013). “Nexus” is “a legally and factually sufficient connection between the [objective evidence] and the patented invention, such that the objective evidence should be considered in the determination of nonobviousness.” *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). The burden of showing that there is a nexus lies with Patent Owner. *In re Paulsen*, 30 F.3d 1475, 1482 (Fed. Cir. 1994).

In its Response, Patent Owner argues the secondary considerations of long-felt need, failure of others, and industry recognition demonstrate non-obviousness.⁸ PO Resp. 37–39. Patent Owner relies on the declaration of Dr. Icove in support of its contentions. See Ex. 2001 ¶¶ 37, 43–45, 48, 50–51, 169.

We have considered the evidence of obviousness of claim 1 set forth above in conjunction with the arguments and evidence of secondary considerations, and conclude that on balance, the secondary considerations evidence does not outweigh the strong evidence of obviousness.

⁸ The parties’ arguments with respect to secondary considerations are directed to claims 1–7 collectively. See PO Resp. 37–39; Reply 18–22.

First, Patent Owner has failed to provide persuasive evidence of a nexus between the asserted considerations and the claimed invention of the '763 patent. Indeed, Patent Owner does not address specifically the issue of nexus in its Response. *See* PO Resp. 37–39. At the oral hearing, however, Patent Owner asserted that nexus is provided “by the general counsel of Omega Flex,” a “competitor of [Petitioner],” who “put[] up [a] slide” at a City Council hearing of Lubbock, Texas identifying the '448 and '763 patents and stating that “[Patent Owner] has a monopoly on a solution that could meet the higher standard,” which would require an “increased threshold of 85 Coulombs [that] would be required to eliminate CSST perforation at the 95 percentile.” Tr. 29:11–30:21; Ex. 2001 ¶ 50. However, a slide and testimony identifying a lawsuit involving the '763 patent and the '448 patent, without providing any link between any alleged novel aspects of the patented invention and asserted secondary considerations, does not establish the requisite nexus.

Similarly, we are not persuaded that the paragraphs of Dr. Icové's declaration cited in Patent Owner's Response demonstrate the requisite nexus. PO Resp. 37–39 (citing Ex. 2001 ¶¶ 37, 43–45, 48, 50–51, 169). None of the paragraphs, other than paragraph 169, even mention the claimed invention. *See* Ex. 2001 ¶¶ 37, 43–45, 48, 50–51. Dr. Icové states in paragraph 169 that “[m]anufacture[r]s of CSST have recognized Goodson's advancement over prior art and have begun commercial realizations of his embodiment” and that the “CSST industry has ab[an]doned its prior products based on *Yaman[e]*, *Ohki*, and *Rivest* and replaced them with products embodying Goodson's design.” *Id.* ¶ 169. Dr. Icové does not cite

any supporting evidence for these statements. Therefore, his testimony has little probative value. *See Am. Acad. of Sci.*, 367 F.3d at 1368. As such, Dr. Icove's conclusory assertions do not provide a sufficient connection between the submitted objective evidence and the claimed invention, and so do not establish the nexus required for evidence of secondary considerations.

Second, even if Patent Owner had shown a nexus, Patent Owner's substantive arguments regarding secondary considerations are not persuasive. With respect to long felt need and failure of others, Patent Owner contends that a prior art "CSST 'yellow' jacket product with only an insulation layer as the cover" had "a protective rating of less than 1 Coulomb," and "failed numerous times and caused personal injury and property damage." PO Resp. 37–38 (citing Ex. 2001 ¶¶ 37, 43–45, 48, 169). According to Patent Owner, "studies as early as 1972 have advocated for CSST protection at the 95% level of expected charge related to a lightning strike and such protection would be in the 85 Coulomb range." *Id.* at 37–38 (citing Ex. 2001 ¶¶ 35–37, 48; Ex. 2006; Ex. 2021). Patent Owner further argues that there has "been a long-felt need in the industry for much better protection for CSST than the prior art," including "the 'original yellow' jacket product." *Id.* at 37–38 (citing Ex. 2006). Patent Owner states "Dr. Icove opines unequivocally that the solution is the Goodson '763 Patent, and that the industry has abandoned prior art products." *Id.* (citing Ex. 2001 ¶ 169).

Patent Owner's arguments are not persuasive of long-felt need and failure of others. The 1972 study (Ex. 2021) that Patent Owner contends "advocated for CSST protection at the 95% level of expected charge related

to a lightning strike” relates to the impact of lightning strikes on “engineering systems” and does not mention CSST or gas tubing. A study discussing the impact of lightning on engineering systems does not show a long-felt need related to the invention disclosed and claimed in the ’763 patent, which relates to an electrical shunt for gas tubing. Nor are Patent Owner’s arguments relating to the failure of the “original ‘yellow’ jacket product” persuasive. *See* PO Resp. 37–38. Patent Owner does not explain the circumstances under which anyone tried but failed to solve the alleged problems with CSST, and does not provide argument or evidence that makes a connection between any failure of others and any alleged novel aspect of the ’763 patent. Moreover, Patent Owner has not provided explanation or evidence that the claimed invention “*satisfied* a long-felt and unmet need.” *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1332 (Fed. Cir. 2009) (emphasis added). For example, Patent Owner has not provided any evidence (e.g., experimental evidence) that the claimed invention provides CSST protection at the 95% level of expected charge related to a lightning strike. *See, e.g.*, PO Resp. 37–39. To the contrary, Patent Owner asserts that the alleged problems with CSST had not been solved even years after the effective filing date of the ’763 patent. *Id.* at 38 (citing Ex. 2006, published in 2011).

Patent Owner also contends the “CSST industry is moving to adopt stricter CSST standards . . . and has recognized the contribution of [Mark E. Goodson, the inventor of the ’763 patent] and he has provided information to the building code hearings recently held in Lubbock, Texas and the ’763 Patent was referenced during the hearings.” *Id.* at 38–39. Dr. Icove states

that testimony at the city council meeting “referenced that Goodson has advised the model code committee.” Ex. 2001 ¶ 50. However, Patent Owner does not explain in any detail how Mr. Goodson’s advice to a model code committee, or other comments made at the meeting, constitute evidence of industry praise. *See In re Cree, Inc.*, 818 F.3d 694, 702 (Fed. Cir. 2016) (discounting self-recognition of inventor’s own work as “self-serving statements”). Similarly, Patent Owner does not persuasively explain how identification of the ’763 patent constitutes industry praise of the patent, let alone industry praise for any novel or nonobvious aspects of the patent. Finally, Patent Owner does not explain how comments made at a city council meeting can be considered recognition in the CSST “industry.” *See* Reply 22.

We have considered all of Patent Owner’s evidence of non-obviousness and find it unpersuasive. Accordingly, when we balance Petitioner’s strong evidence of obviousness against Patent Owner’s alleged objective evidence of nonobviousness, we determine that a preponderance of the evidence supports Petitioner’s position that claim 1 is unpatentable under 35 U.S.C. § 103 over Yamane and the Design Guide.

6. Claims 2–5 and 7

Relying on the testimony of Dr. Rakov, Petitioner argues that claims 2 through 5 and 7, which depend directly or indirectly from claim 1, are unpatentable over Yamane and the Design Guide. We have reviewed the evidence and Petitioner’s arguments, and determine that Petitioner has shown where each of the limitations of claims 2 through 5 and 7 is taught by

Yamane or the Design Guide, and has articulated a sufficient rationale for combining the teachings of the prior art.

Both Yamane and the Design Guide disclose “gas tubing [that] comprises Corrugated Stainless Steel Tubing (CSST)” as required by claim 2. *See, e.g.*, Ex. 1019 ¶ 16 (stating “tube body 2 is composed of a flexible metal conductive member . . . consisting of stainless steel,” and the “tube walls consist of a bendable corrugated tubing [having a] corrugated shape”); Ex. 1021, 3 (stating the system “uses corrugated stainless steel tubing (CSST)”); *see also* Ex. 1021, 2, 4.

The Design Guide teaches connective fittings (i.e., connecting means) made of brass as required by claim 3. *See, e.g.*, Ex. 1021, 3, 5, 91. We are persuaded by Petitioner’s arguments and evidence, including Dr. Rakov’s un rebutted testimony, that one of ordinary skill in the art would have known that brass fittings were “commonly used in lightning protection systems because brass is a copper alloy” that is “highly conductive, relatively inexpensive, and as resistive to corrosion as copper,” and that it would have been an obvious design choice to use brass connective fittings for the connective joints in the Yamane lightning-proof tubing. Ex. 1028 ¶¶ 126–127, 160–161; *see also* Ex. 1001, 4:46–51 (stating prior art corrugated gas tubing “often” used brass fittings); Ex. 1002, 55.

With respect to claims 4 and 5, claim 4 requires that the “conducting means is made of copper” and claim 5 requires that “the copper is approximately number 8 America Wire Gauge (AWG) or larger.” We are persuaded by Dr. Rakov’s un rebutted testimony that it would have been an obvious design choice to use copper wire of approximately 8 AWG as the

conductive members in Yamane’s lightning-proof tubing. Dr. Rakov testifies that copper wire was commonly used in lighting protection systems because copper wire is “highly conductive, resistant to corrosion, and relatively inexpensive,” that “heavy gauge copper wires are commonly used for current diversion and bonding in lighting protection systems,” and that “smaller gauge wire likely would not be able to carry lightning current.” Ex. 1028 ¶¶ 166, 168; Ex. 1024, 55, 191–192. Claim 7 requires that “the gas tubing comprises Gas Appliance Connector (GAC).” We are persuaded by Dr. Rakov’s un rebutted testimony that it would have been obvious to one of ordinary skill in the art that the lightning-proof tubing of Yamane would apply to Gas Appliance Connectors, “which are essentially just pre-fabricated, short run of CSST with pre-attached end connectors.” Ex. 1028 ¶¶ 174–175; *see also* Ex. 1001, 6:1–3 (stating GAC is similar to CSST “in that it has thin walls, corrugations, and is easily bent or manipulated”); Ex. 1019 ¶ 21 (stating the lightning-proof tubing also is based on corrugated, stainless steel, flexible, thin-walled tubing).

Patent Owner does not argue separately the patentability of dependent claims 2 through 5 and 7. *See* PO Resp. 33–34. Having considered the parties’ contentions and supporting evidence, including evidence of secondary considerations of nonobviousness submitted by Patent Owner, we determine that Petitioner has shown by a preponderance of the evidence that claims 2 through 5 and 7 are unpatentable under 35 U.S.C. § 103 over Yamane and the Design Guide.

*D. Obviousness of Claims 1–4, 6, and 7 over
Ohki and the Design Guide*

Petitioner contends claims 1 through 4, 6, and 7 are unpatentable under 35 U.S.C. § 103 as obvious over Ohki in combination with the Design Guide. Pet. 40–51. Relying on the testimony of Dr. Rakov, Petitioner explains how Ohki and the Design Guide teach the limitations of the challenged claims. *Id.* (citing Ex. 1028). Having considered the parties’ contentions and supporting evidence, including evidence of secondary considerations of nonobviousness submitted by Patent Owner, we determine that Petitioner has shown by a preponderance of the evidence that claims 1 through 4, 6, and 7 are unpatentable under 35 U.S.C. § 103 over Ohki and the Design Guide.

1. Ohki

Ohki, like Yamane, is entitled “Lightning-Proof Tubing,” and describes various embodiments of covered corrugated stainless steel tubing “capable of withstanding a discharge during a lightning strike without damage to the tube body.” Ex. 1020, Abstract, ¶¶ 2, 7, 16. The corrugated steel tubing is used to carry gas and is connected to electroconductive equipment by “an ordinary connecting joint.” *Id.* ¶¶ 2, 16. To prevent damage to the tubing from lightning strikes, Ohki teaches covering the tube with conductive cover layer 3 that can be a metal mesh. *Id.* ¶ 26. Figure 2 of Ohki discloses an “insulation layer” between the conductive layer and the

inner tube body that prevents electrical conduction between the two. *Id.*

Figure 2 of Ohki is reproduced below.

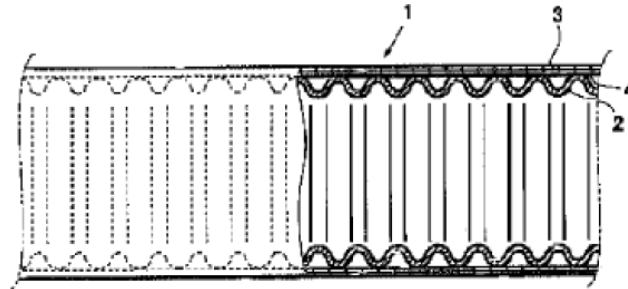


Figure 2 depicts lightning-proof tubing 1, having tube body 2, conductive layer 3, and insulation layer 4 that is laminated over the inner peripheral face of conductive layer 3. Ex. 1020 ¶¶ 25–26. “[T]he insulation layer 4 prevents electrical conduction between the tube body 2 and the conductive cover layer 3, and conduction between the tube body 2 and the conductive layer 3 may be accomplished by [] a connecting joint between the lightning-proof tubing 1 and the electroconductive equipment.” *Id.* ¶ 26. Conductive cover layer 3 may be “constituted by a conductive polymer,” “may be a conductive resin,” “or it can be constituted by a metal film or a metal mesh.” *Id.* ¶¶ 17, 26.

2. Claim 1

Petitioner explains how the combination of Ohki and the Design Guide teaches each of the limitations of independent claim 1. Pet. 40–48. Petitioner argues that Ohki’s conductive cover layer, which includes a metal mesh, over “tubing used in an internal gas pipe system” that “can withstand a discharge during a lightning strike without damage to the body” teaches the preamble reciting “an electrical shunt for gas tubing” of claim 1. *Id.* at 41 (citing Ex. 1020 ¶¶ 3, 4, 26; Ex. 1028 ¶ 186) (emphasis omitted).

Petitioner contends Ohki teaches that most of the current from a lightning strike goes to ground via the conductive cover layer, keeping it off of the inner gas tube, thereby protecting the inner tube. *Id.* (citing Ex. 1020 ¶¶ 3, 4, 17, 19, 26). Patent Owner does not dispute that Ohki teaches the preamble of claim 1.

Petitioner argues Ohki’s “ordinary connecting joint” teaches the “connecting means” recited in claim 1(a). *Id.* at 41–42 (citing Ex. 1020 ¶ 16; Ex. 1028 ¶ 188; Ex. 1021, 4–5, 13–15; *see also* Ex. 1024, 76 (“end connectors are well known in the art”). Relying on unrebutted testimony of Dr. Rakov and the Design Guide’s disclosure of brass end conductors, Petitioner contends that one of ordinary skill in the art would have understood that the ordinary connecting joint of Ohki would have been “made of a conductive material,” such as brass, “that has a higher conductivity than the gas tubing” as recited in claim 1(a). *Id.* at 42–43 (citing Ex. 1028 ¶¶ 187–197; Ex. 1021 3, 5, 91; Ex. 1001, 4:51–56). Patent Owner does not dispute that Ohki teaches claim element 1(a).

As to the “conducting means” of claim 1(b), we agree with Petitioner that the combination of Ohki and the Design Guide teach a metal mesh that performs the recited functions and is the same as, or equivalent to, mesh 650 in the specification of the ’763 patent, for the reasons stated by Petitioner and explained in further detail below. *See id.* at 44–48.

We have reviewed the evidence and argument and find that Petitioner has shown where each of the limitations of claim 1 is taught by Ohki or the Design Guide and has articulated a sufficient rationale for combining the teachings of the prior art. Again, Patent Owner’s arguments are premised

mainly on its proposed claim interpretation of the “conducting means” of claim 1(b), with which we disagree, *see supra* Section II.B.2, and even if Patent Owner’s proposed interpretation was adopted, we are persuaded that Ohki teaches the disputed limitation.

Patent Owner first argues that Ohki does not teach the conducting means of claim 1(b) because Ohki does not teach “(1) a ground wire not touching the surface of the CSST tubing, thereby creating an electrical path ‘in parallel’ with the surface of the CSST tubing which ‘directly’ connects the end connectors on either side of the CSST tubing run to create the electrical shunt; or (2) with respect to a mesh shroud proximate to the surface of the CSST, where the mesh is not touching the surface of the CSST.” PO Resp. 35 (citing Ex. 2001 ¶¶ 153–158, 163). Patent Owner also contends that Ohki, like Yamane, is designed to “short” the conducting layer by physically connecting the conductive layer with the surface of the CSST and that Ohki’s design is the “exact opposite of a ‘parallel’ connection as claimed in the ’763 patent. *Id.* at 3.

Patent Owner’s arguments are not persuasive because Ohki teaches a mesh not touching the surface of the CSST. Ohki teaches an “insulation layer” between the conductive layer (mesh) and the inner tube body that “prevents electrical conduction” between the two. Ex. 1020 ¶ 26, Fig. 2. Ohki explains that because “tube body 2 can be separated from . . . conductive cover layer 3 by the insulation layer 4, . . . a discharge during a lightning strike will have even less of an effect on the tube body 2.” *Id.* ¶ 27. We agree with Petitioner that in such an embodiment, the tube and the conductive layer (mesh) are “electrically isolated from each other” and that

the “conductive cover layer/metal mesh of Ohki” provides “direct electrical contact” between the connecting means. Pet. 45, 48; Reply 16–17; Ex. 1028 ¶¶ 202–204, 226.

Patent Owner’s remaining arguments as to why the structure of Ohki is not equivalent to the structures of the ’763 patent are similar to its arguments as to why the structure of Yamane is not equivalent to the structures of the ’763 patent. *See, e.g.*, PO Resp. 1–2 (stating “use of a resin layer by *Yamane* and *Ohki* is a design flaw”), 4 (stating “[t]he only conducting structures disclosed by *Yamane* and *Ohki* have the shunt wire in close electrical contact with the surface of the CSST tubing”), 5 (stating the “configuration of the conducting layer and insulating layer shown in *Yamane* and *Ohki*” is “the exact opposite of a ‘parallel’ connection as claimed in the ’763 Patent”), 18 (stating the structures of *Yamane* and *Ohki* “are not ‘parallel’ configurations”), 19–20, 26–27 (stating both *Yamane* and *Ohki* “involve dissipating charge over the surface of the CSST tubing in the event the electrical insult pierces the cover layers”). As explained above, these arguments are not persuasive.

Petitioner has shown that Ohki and the Design Guide teach all of the limitations of claim 1 and that a person of ordinary skill in the art would have had reason to combine their teachings in the manner asserted. Patent Owner’s arguments regarding secondary considerations of nonobviousness are not persuasive. *See supra* Section II.C.5. For the reasons discussed above, Petitioner has demonstrated by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103 over Ohki and the Design Guide.

3. Claims 2–4, 6, and 7

Relying on the testimony of Dr. Rakov, Petitioner contends the combination of Ohki and the Design Guide teaches each of the limitations of dependent claims 2–4, 6, and 7. Pet. 48–51. Patent Owner does not dispute Petitioner’s contentions as to these claims.

We agree with Petitioner that Ohki teaches “Corrugated Stainless Steel Tubing (CSST)” as required by claim 2 and further teaches that “the conducting means comprises a mesh surrounding the gas tubing” as required by claim 6. *See, e.g.*, Ex. 1020 ¶¶ 13–16 (stating Ohki is directed to “gas tubing” made of “stainless steel” with a “corrugated shape”), 11 (stating “the conductive cover layer is constituted by a metal mesh”). Claim 3 requires that “the connecting means are made of brass.” We agree with Petitioner’s un rebutted evidence that the Design Guide teaches brass fittings and that it would have been obvious to one of ordinary skill in the art to use brass material for the connective fittings (i.e., connecting means) of Ohki. Pet. 49 (citing Ex. 1028 ¶¶ 232–235; Ex. 1024, 55; Ex. 1001, 4:52–56).

Claim 4 requires that the “conducting means is made of copper.” Ohki teaches that its conductive cover layer can be made using copper. Ex. 1020 ¶ 17. Petitioner has provided evidence, including Dr. Rakov’s un rebutted testimony, that an ordinarily skilled artisan would have known that copper wire is the most commonly used wire in lightning protection systems and that it would have been obvious to form the metal mesh of Ohki using copper wires. Pet. 49–50; Ex. 1028 ¶¶ 237–240. Claim 7 requires that “the gas tubing comprises Gas Appliance Connector (GAC).” We are persuaded by Dr. Rakov’s un rebutted testimony that it would have been

obvious to one of ordinary skill in the art that the lightning-proof tubing of Ohki (like Yamane) would apply to Gas Appliance Connectors. Ex. 1028 ¶¶ 247–248; *see also* Ex. 1001, 6:1–3 (stating GAC is similar to CSST “in that it has thin walls, corrugations, and is easily bent or manipulated”).

Petitioner has shown that Ohki and the Design Guide teach all of the limitations of claims 2 through 4, 6, and 7, and that a person of ordinary skill in the art would have had reason to combine their teachings in the manner asserted. Patent Owner’s arguments regarding secondary considerations of nonobviousness are not persuasive. *See supra* Section II.C.5. For the foregoing reasons, we determine Petitioner has demonstrated, by a preponderance of the evidence, that claims 2 through 4, 6, and 7 are unpatentable over Ohki and the Design Guide.

*E. Obviousness of Claim 6
over Yamane, the Design Guide, and Ohki*

Claim 6 depends from claim 1 and further requires that the “conducting means comprises a mesh surrounding the gas tubing.” Petitioner asserts that it would have been obvious to substitute the “metal mesh” taught in Ohki for the conductive member of Yamane because (1) one of ordinary skill in the art would have understood a metal mesh provides additional protection from arcing caused by lightning, (2) a mesh would have reinforced the Yamane tubing and made it more bendable, and (3) the substitution would have been “nothing ‘more than the predictable use of

prior art elements according to their established functions.” Pet. 38–40 (citing Ex. 1020, claim 7, ¶¶ 1–3, 16, 18–37; Ex. 1028 ¶¶ 178–183).

Petitioner has shown that the combination of Yamane, the Design Guide, and Ohki teaches the limitations of claim 6 and has articulated sufficient reasoning for combining the teachings of the references. We are not persuaded by Patent Owner’s argument that Ohki does not teach the conducting means of claim 1 (PO Resp. 34–35) for the same reasons discussed above in Section II.D.2. Patent Owner’s arguments regarding secondary considerations of nonobviousness are not persuasive. *See supra* Section II.C.5. Therefore, we determine that Petitioner has shown by a preponderance of the evidence that claim 6 is unpatentable under 35 U.S.C. § 103 over Yamane, the Design Guide, and Ohki.

*F. Obviousness of Claims 1–4 and 7
over Rivest, Yamane, and the Design Guide, or
over Rivest, Ohki, and the Design Guide*

Petitioner contends claims 1 through 4 and 7 are unpatentable under 35 U.S.C. § 103 as obvious over Rivest and the Design Guide in light of either Yamane or Ohki. Pet. 51–60. Relying on the testimony of Dr. Rakov, Petitioner explains how Rivest and the Design Guide in combination with Yamane or Ohki teach the limitations of the challenged claims. *Id.* (citing Ex. 1028 ¶¶ 249–255). Having considered the parties’ contentions and supporting evidence, including evidence of secondary considerations of nonobviousness submitted by Patent Owner, for the reasons set forth below we determine that Petitioner has shown by a preponderance of the evidence that claims 1 through 4 and 7 are unpatentable under 35 U.S.C. § 103 over

Rivest, the Design Guide, and Yamane as well as over Rivest, the Design Guide, and Ohki.

1. Rivest

Rivest describes corrugated stainless steel tubing, used for transporting gas, covered with a conductive thermoplastic polymer jacket and having brass end fittings 16. Ex. 1006, 1:13–15, 1:60–2:1, 2:17–20, 3:53–58. Rivest explains that because “the jacket 14 is made from a conductive thermoplastic, charge accumulated on jacket 14 (e.g., due to direct or indirect lightning strike) is conducted through the jacket 14 to the tubing 12 and then to the end fittings 16 and through components connected to fittings 16. Thus, the tubing 12 is not damaged by a buildup of charge on a non-conductive jacket.” *Id.* at 3:59–65.

2. Claim 1

Relying on the testimony of Dr. Rakov, Petitioner explains how the combination of Rivest, Yamane, and the Design Guide, and the combination of Rivest, Ohki, and the Design Guide, teach the limitations of claim 1. Pet. 51–58.

Petitioner asserts that Rivest, Yamane, and Ohki are each directed to mitigating electrical insult to corrugated gas tubing and that Yamane and Ohki each teach an electrical shunt for gas tubing. *Id.* at 54. Petitioner further contends that Yamane, Ohki, and Rivest each teach the connecting means of claim 1(a). *Id.* at 55 (citing, *inter alia*, Ex. 1006, 3:53–58; Ex. 1028 ¶¶ 263, 267). Petitioner asserts, for example, that Rivest’s brass fittings 16, which are “[a]t one or both ends of the tubing assembly” teach the connecting means of claim 1. *Id.* (emphases omitted). We agree with

Petitioner that the combination of Rivest, the Design Guide, and Yamane, as well as the combination of Rivest, the Design Guide, and Ohki, teach end connectors that are the same as, or equivalent to, end connectors 610 and 620 in the specification of the '763 patent, and teach an electrical shunt for gas tubing.

Petitioner acknowledges that Rivest does not teach coupling a conductive wire to its connectors to establish a direct electrical connection between them, but asserts it would have been obvious to substitute the metal mesh of Ohki for the conductive jacket of Rivest, as a simple substitution of one known element (the mesh of Ohki) for another known element (polymer jacket of Rivest) using a known technique to improve a similar device, and because Ohki explicitly teaches substituting a mesh for a conductive polymer. *Id.* at 51–53 (quoting Ex. 1020 ¶ 26 (“the conductive cover layer 3 can be constituted by a conductive polymer . . . or it can be constituted by a metal film or a metal mesh”)); Ex. 1028 ¶¶ 251–252. For similar reasons, Petitioner asserts it would have been obvious to substitute the polymer jacket of Rivest with the more conductive members of Yamane as a simple substitution with predictable results. Pet. 53–54; Ex. 1028 ¶¶ 253–255. Petitioner further argues that the conductive wire of Yamane and Ohki both carry “a sufficient amount of the electrical current to ground so as to prevent damage to the inner tubing from the electrical current.” Pet. 58 (citing Ex. 1019 ¶ 36; Ex. 1020 ¶ 31).

We agree with Petitioner that the combination of Rivest, Yamane, and the Design Guide teach a conductive wire that performs the recited functions and is the same as, or equivalent to, wire 601 in the specification

of the '763 patent. We also agree with Petitioner that the combination of Rivest, Ohki, and the Design Guide teach a metal mesh that performs the recited functions and is the same as, or equivalent to, mesh 650 in the specification of the '763 patent.

Petitioner has shown that the combination of Rivest, Yamane, and the Design Guide, as well as the combination of Rivest, Ohki, and the Design Guide, teach all of the limitations of claim 1 and has articulated sufficient reasoning for combining the teachings of the references. For the reasons explained below, we are not persuaded by Patent Owner's arguments to the contrary. PO Resp. 36.

Patent Owner argues Rivest fails to teach the "conducting means" of claim 1(b). *Id.* This argument is not persuasive because Petitioner is relying upon the teachings of either Yamane or Ohki, not Rivest, to teach the conducting means. As explained above, Petitioner has shown sufficiently that Yamane and Ohki teach the conducting means of claim 1 and that one of ordinary skill in the art would have had reason to combine the teachings of Rivest and Yamane and the teachings of Rivest and Ohki. *See* Pet. 51–53; Ex. 1028 ¶¶ 249–255. Patent Owner's arguments regarding secondary considerations of nonobviousness are not persuasive. *See supra* Section II.C.4. Accordingly, Petitioner has shown by a preponderance of the evidence that claim 1 is unpatentable under 35 U.S.C. § 103 over the combination of Rivest, Yamane, and the Design Guide, as well as over the combination of Rivest, Ohki, and the Design Guide.

3. Claims 2–4 and 7

Petitioner contends Rivest, Yamane, and Ohki each disclose corrugated stainless steel tubing, thereby satisfying the limitation of claim 2 requiring “the gas tubing [to] compris[e] Corrugated Stainless Steel Tubing (CSST).” Pet. 58 (citing Ex. 1006, 2:18–20; Ex. 1019 ¶ 21; Ex. 1020 ¶ 16; 1028 ¶ 290). Petitioner also contends that Rivest’s disclosure of “end connectors made of brass” teaches the limitation of claim 3 requiring that the “connecting means are made of brass.” *Id.* at 59 (citing Ex. 1006, 3:53–58; Ex. 1028 ¶ 292).

Claim 4 requires that the “conducting means is made of copper” and claim 7 requires that the gas tubing comprises GAC. Relying on Dr. Rakov’s testimony, Petitioner asserts that it would have been obvious to have the conductive wire of Yamane or the conductive mesh of Ohki be made of copper and that a person of ordinary skill in the art would have understood the disclosed inventions in Rivest, Yamane, and Ohki to apply to gas tubing that comprises GAC as recited in claim 7. *Id.* (citing Ex. 1028 ¶¶ 294, 297; Ex. 1002, 192).

Patent Owner does not separately argue the patentability of claims 2 through 4 and 7. *See* PO Resp. 36. We have reviewed the evidence and arguments and find that Petitioner has shown where each of the limitations of claims 2 through 4 and 7 are taught by Rivest and Yamane and by Rivest and Ohki and has articulated a sufficient rationale for combining the teachings of the prior art. Patent Owner’s arguments regarding secondary considerations of nonobviousness are not persuasive. *See supra* Section II.C.5. As such, we determine that Petitioner has demonstrated by a

preponderance of the evidence that claims 2 through 4 and 7 are unpatentable over the combination of Rivest, Yamane, and the Design Guide, as well as over the combination of Rivest, Ohki, and the Design Guide.

G. Obviousness of Claim 6 over Rivest, Ohki, and the Design Guide

Petitioner contends claim 6, which requires the “conducting means [to] comprise[] a mesh surrounding the gas tubing” is unpatentable under 35 U.S.C. § 103 as obvious over Rivest, Ohki, and the Design Guide. Pet. 60. Petitioner contends that it would have been obvious to use the mesh of Ohki instead of, or in addition to, the conductive polymer jacket of Rivest, in view of Ohki’s teaching that “conductive layer 3 can be constituted by a conductive polymer . . . or it can be constituted by a metal film or metal mesh.” *Id.* (quoting Ex. 1020 ¶ 26 (emphases omitted)); Ex. 1028 ¶ 300; Ex. 1006, 1:60–2:1. Patent Owner’s argument that claim 6 is patentable because Rivest does not teach the “conducting means” of claim 1(b) (*see* PO Resp. 36) is not persuasive for the reasons stated above, and Patent Owner’s arguments regarding secondary considerations of nonobviousness are not persuasive (*see supra* Section II.C.5). Having considered the parties’ contentions and supporting evidence, including evidence of secondary considerations of nonobviousness submitted by Patent Owner, we determine that Petitioner has demonstrated by a preponderance of the evidence that claim 6 is unpatentable over the combination of Rivest, Ohki, and the Design Guide.

III. CONCLUSION

Based on the evidence and arguments, Petitioner has demonstrated by a preponderance of the evidence that:

- (1) Claims 1–5 and 7 as unpatentable under 35 U.S.C. § 103 over Yamane and the Design Guide;
- (2) Claim 6 as unpatentable under 35 U.S.C. § 103 over Yamane, the Design Guide, and Ohki;
- (3) Claims 1–4, 6, and 7 as unpatentable under 35 U.S.C. § 103 over Ohki and the Design Guide;
- (4) Claims 1–4 and 7 as unpatentable under 35 U.S.C. § 103 over Rivest, Yamane, and the Design Guide; and
- (5) Claims 1–4, 6, and 7 as unpatentable under 35 U.S.C. § 103 over Rivest, Ohki, and the Design Guide.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–7 of U.S. Patent No. 7,821,763 B2 are held to be 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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Patent 7,821,763 B2

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