

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CARDIOVASCULAR SYSTEMS, INC.,
Petitioner,

v.

SHOCKWAVE MEDICAL, INC.,
Patent Owner.

Case IPR2019-00408
Patent 9,642,673 B2

Before MITCHELL G. WEATHERLY, RICHARD H. MARSCHALL, and
AVELYN M. ROSS, *Administrative Patent Judges*.

WEATHERLY, *Administrative Patent Judge*.

DECISION

Instituting *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

A. BACKGROUND

Cardiovascular Systems, Inc. (“Petitioner”) filed a petition (Paper 1, “Pet.”) to institute an *inter partes* review of claims 1–20 (the “challenged claims”) of U.S. Patent No. 9,642,673 B2 (Ex. 1001, “the ’673 patent”). 35 U.S.C. § 311. Shockwave Medical, Inc. (“Patent Owner”) timely filed a

Preliminary Response. Paper 10 (“Prelim. Resp.”). Institution of an *inter partes* review is authorized by statute when “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Based on our review of the record, we conclude that Petitioner is reasonably likely to prevail with respect to at least one of the challenged claims.

Petitioner contends that the challenged claims are unpatentable as obvious under 35 U.S.C. § 103 based on the following grounds (Pet. 17–65):

References	Basis	Claims challenged
Hawkins '020, ¹ Hawkins '768, ² and Kunis ³	§ 103	1, 2, 5–8, 15, 16, 19, and 20
Hawkins '020, Hawkins '768, Kunis, and Lesh ⁴	§ 103	3, 4, 9–14, 17, and 18

Generally, Patent Owner contends that the Petition should be denied in its entirety. On April 24, 2018, the Supreme Court held that, under 35 U.S.C. § 314, the Office may not institute review of fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018). For the reasons expressed below, we determine that Petitioner has demonstrated a reasonable likelihood of establishing that at least one claim

¹ U.S. Published Patent App. 2010/0114020 A1 (Ex. 1004, “Hawkins '020”)

² U.S. Published Patent App. 2009/0312768 A1 (Ex. 1003, “Hawkins '768”)

³ U.S. Patent No. 7,850,685 B2 (Ex. 1005, “Kunis”)

⁴ U.S. Published Patent App. 2005/0251131 A1 (Ex. 1006, “Lesh”)

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is unpatentable. In accordance with the *SAS* decision and Office guidance,⁵ we institute an *inter partes* review of all challenged claims of the '673 patent on all grounds alleged by Petitioner.

B. RELATED PROCEEDINGS

Petitioner identified no related matters. Pet. 2. Patent Owner has identified the following petitions for *inter partes* review and patents or patent applications as related matters:

- Petition for *Inter Partes* Review of U.S. Patent No. 8,956,371, IPR2019-00405 (filed December 7, 2018);
- Petition for *Inter Partes* Review of U.S. Patent No. 8,728,091, IPR2019-00409 (filed December 7, 2018);
- U.S. Patent Application No. 14/271,342 filed on May 6, 2014, and issued as U.S. Patent No. 9,011,463 B2;
- U.S. Patent Application No. 15/474,885 filed on March 30, 2017, and issued as U.S. Patent No. 9,993,292 B2; and
- U.S. Patent Application No. 15/979,182 filed on May 11, 2018.

Paper 3, 1.

C. THE '673 PATENT

The '673 patent is directed to an angioplasty balloon catheter that uses electrohydraulic shockwaves to treat calcified lesions in blood vessels.

Ex. 1001, Abstract, 2:41–64. A wire-guided catheter is inserted into the

⁵ “Guidance on the impact of *SAS* on AIA trial proceedings” (Apr. 26, 2018), accessible at <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial> (last accessed Oct. 2, 2018) (“At this time, if the PTAB institutes a trial, the PTAB will institute on all challenges raised in the petition,” and “for pending trials . . . the panel may issue an order supplementing the institution decision to institute on all challenges raised in the petition.”).

patient's blood vessel and positioned near the calcified lesion, and a balloon fixed near the distal end of the catheter is inflated with saline so that the balloon contacts the lesion. *Id.* at 7:21–23. Electrodes within the balloon are connected to a voltage source, which sends electrical impulses of sufficient energy to generate arcs across the electrodes. *Id.* at 6:65–7:4. The arcs generate shockwaves inside the balloon that propagate through the saline and into the lesion, which causes the lesion to break up. *Id.* at 7:5–36.

Although a number of embodiments of the balloon catheter are described in the Specification, the claims appear to recite features illustrated in Figure 12 (reproduced at right). Catheter 710 includes balloon 726 sealed to the distal end of carrier 721. *Id.* at 10:64–11:3.

Carrier 721 includes a plurality of openings 742, 744, 746 spaced apart along its axis. One of electrode pairs 743, 745, and 747 is positioned within each of openings 742, 744, 746. *Id.* at 11:4–13. “One side of the openings 742, 744, and 746 are coated with a conductive material to render one electrode 743a, 745a, and 747a of each electrode pair larger in surface area [than] . . . its other corresponding electrode.” *Id.* at 11:13–17.

Electrode pairs 743, 745, 747, each of which is a shockwave source, are connected in a series circuit to high voltage source 730 as shown in Figure 13 (reproduced at right). *Id.*

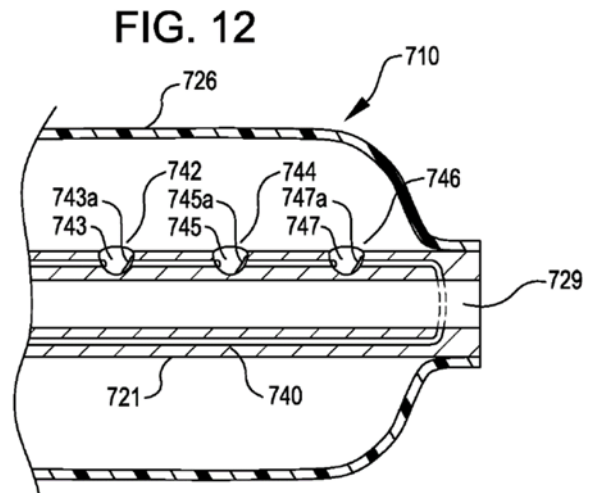
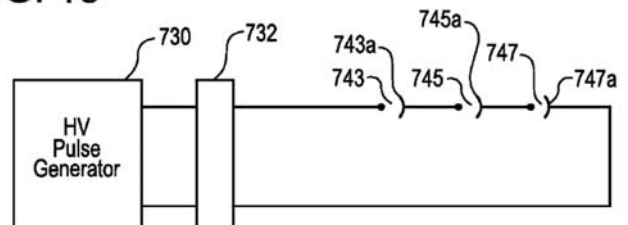


FIG. 13



at 11:19–23. The larger electrode surfaces 743a, 745a, 747a assure “that all of the electrode pairs will reliably arc when the high voltage is applied across the string of shock wave sources.” *Id.* at 11:23–26.

Claims 1, 9, and 15 are the independent claims among the challenged claims. *Id.* at 12:10–14:45. Claim 1, which is illustrative, recites:

1. A device comprising:

[a] an axially extending elongate member;

[b] a balloon surrounding a portion of the elongate member, said balloon being fillable with a conductive fluid;

[c] a first electrode pair having first and second spaced apart electrodes and a second electrode pair having first and second spaced apart electrodes,

[d] said electrode pairs being located within and spaced from the balloon, said electrode pairs being mounted on the elongate member and within the conductive fluid and wherein the electrode pairs are configured to produce shock waves that propagate through the liquid, and

[e] wherein one electrode in each pair has a surface area larger than the surface area of the other electrode in the pair; and

[f] a high voltage source connectable to the first electrode of first electrode pair, and with the second electrode of first electrode pair being connected to the first electrode of the second electrode pair, and with the second electrode of the second electrode pair being connectable to the high voltage source, and

[g] wherein when a high voltage pulse is supplied to the first and second electrode pairs, a first arc is generated in the conductive fluid allowing current to flow across the first electrode pair and a second arc is generated in the conductive fluid allowing current to flow across the second electrode pair, thereby creating a series connection running from the first electrode in the first electrode pair to the second electrode of the second pair.

Id. at 12:10–38 (with line breaks and letter designations [a]–[g] added to aid discussion).

II. ANALYSIS

A. CLAIM INTERPRETATION

For petitions such as this one that are filed after November 13, 2018, we interpret claims in the same manner used in a civil action under 35 U.S.C. § 282(b) “including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b) (2018).⁶ Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Neither party expressly interprets any terms in the claims of the ’673 patent. Pet. 16–17; *see also* Prelim. Resp. (not expressly addressing claim interpretation). We discern no reason to interpret expressly any claim language at this stage of the proceeding. Accordingly, when analyzing Petitioner’s challenges, we read the claim language in accordance with the principles set forth above.

⁶ On October 11, 2018, the USPTO revised its rules to harmonize the Board’s claim construction standard with that used in federal district court. Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42). This rule change applies to petitions filed on or after November 13, 2018. *Id.*

B. LEGAL STANDARDS

Petitioner challenges the patentability of claims 1–20 on the grounds that the claims are obvious. The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness as set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The *KSR* Court summarized the four factual inquiries set forth in *Graham* that we apply in determining whether a claim is reasonably likely to be unpatentable as obvious under 35 U.S.C. § 103(a) as follows: (1) determining the scope and content of the prior art, (2) ascertaining the differences between the prior art and the claims at issue, (3) resolving the level of ordinary skill in the pertinent art, and (4) considering objective evidence indicating obviousness or nonobviousness. *KSR*, 550 U.S. at 406. With these standards in mind, we address each challenge below.

C. LEVEL OF ORDINARY SKILL IN THE ART

We review the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art at the time of the invention. *Graham*, 383 U.S. at 17. Petitioner submits that the ordinarily skilled artisan would have

knowledge roughly equivalent to the knowledge and/or training of a person holding the degree of Bachelor of Science in Mechanical Engineering, Biomedical Engineering, or equivalent, and between three and five years of practical experience, including familiarity with the various medical devices and techniques for angioplasty lithotripsy, and/or familiarity with electro-pulsed surgical devices generally.

Pet. 16; *see also* Ex. 1002 ¶ 18 (same).

Patent Owner does not disagree with Petitioner’s description of the level of ordinary skill in the art. *See generally* Prelim. Resp. Neither

Petitioner nor Patent Owner indicates that the resolution of a dispute about the level of ordinary skill in the art determines whether any claim is unpatentable.

For purposes of this Decision, and based on the current record, we accept Petitioner’s definition.⁷ Further, we find that the prior art of record reflects the level of skill in the art at the time of the invention. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). We will make a final determination as to the level of ordinary skill in the art, however, based on the entire record developed during the trial.

D. CLAIMS 1, 2, 5–8, 15, 16, 19, AND 20: OBVIOUSNESS IN VIEW OF HAWKINS ’020, HAWKINS ’768, AND KUNIS

Petitioner argues that claims 1, 2, 5–8, 15, 16, 19, and 20 are unpatentable as obvious in view of the combined teachings of Hawkins ’020, Hawkins ’768, and Kunis. Pet. 17–65. For the reasons expressed below, Petitioner has demonstrated a reasonable likelihood of establishing that these claims are unpatentable as obvious.

1. *Overview of the Asserted Prior Art*

a) *Hawkins ’020*

Hawkins ’020 relates to a “treatment system for stenotic or calcified aortic valves,” using shockwaves generated within a balloon that propagate through liquid in the balloon to impinge upon the targeted valve. Ex. 1004 ¶¶ 7–8. One embodiment of the system is illustrated in Figure 3 (below).

⁷ For purposes of this Decision, we find that Dr. Jensen is qualified to opine about the knowledge of a person having ordinary skill in the art at the time of the invention. Ex. 1002 ¶¶ 8–13 (statement of qualifications), Appendix A (curriculum vitae).

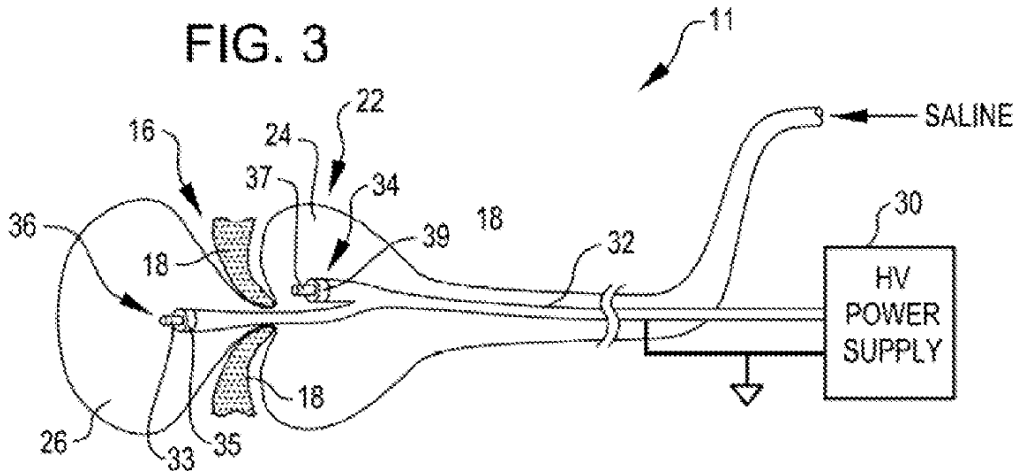


Figure 3 is a schematic view of a dual shockwave balloon attached to a high voltage power supply. *Id.* ¶ 24.

Dual shockwave balloon 22 of system 11 receives catheter 32 connected to high voltage power supply 30. *Id.* ¶ 28. Figure 3 illustrates balloon 22 positioned for treatment such that chambers 24 and 26 surround leaflets 18 of aortic valve 16. *Id.* Electrode pair 34 is located within chamber 24, and electrode pair 36 is located within chamber 26. *Id.* Electrode pair 34 includes central conductor 37 as one electrode and outer conductive shield 39 as the other electrode. *Id.* Electrode pair 36 is similarly arranged with central conductor 33 as one electrode and shield 35 as the other. *Id.* Figure 3 implies that shields 35, 39 are commonly connected to ground, but Hawkins '020 does not expressly describe how electrode pairs 34, 36 are wired to power supply 30. *Id.*, Figure 3.

b) Hawkins '768

Hawkins '768 is directed to “a treatment system for percutaneous coronary angioplasty or peripheral angioplasty in which a dilation catheter is used to cross a lesion in order to dilate the lesion and restore normal blood flow in the artery.” Ex. 1003 ¶ 2. Hawkins '768 illustrates its angioplasty balloon catheter 20 with electrodes 22, 24 within balloon 26 in Figure 2

(reproduced below), which generate arcs that create shock waves within balloon 26 to break up calcified lesions in a blood vessel.

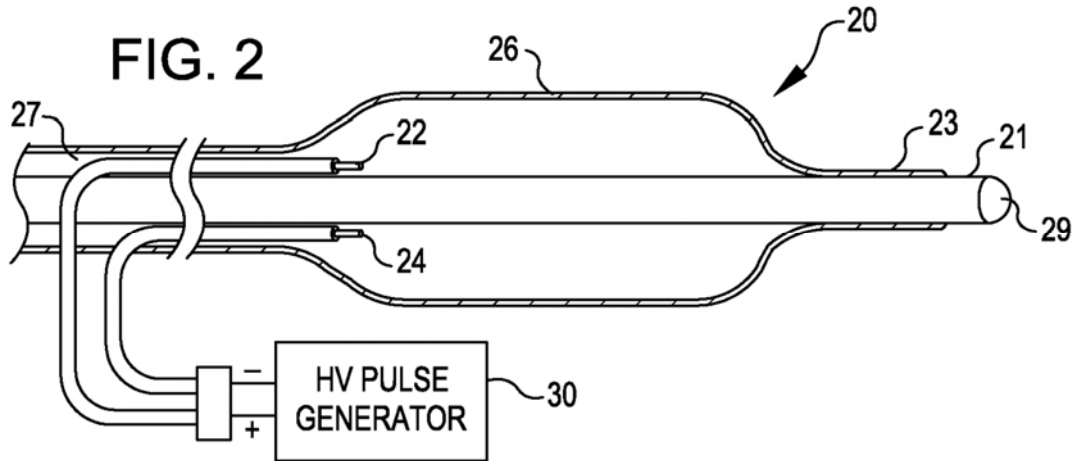
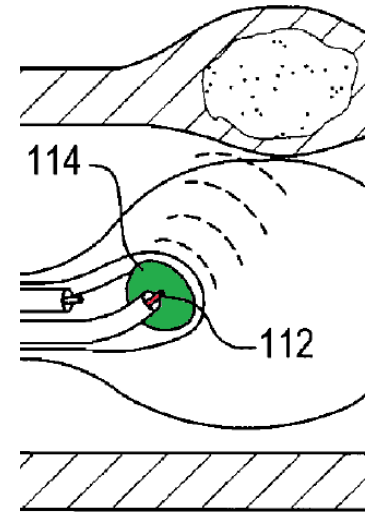


FIG. 2 is a side view of a dilating angioplasty balloon catheter with two electrodes within the balloon. *Id.* ¶ 28.

Balloon 26 may be inflated with water or saline to gently fix balloon 26 against the walls of an artery in direct proximity to a calcified lesion. *Id.* ¶ 51. Carrier 21 includes lumen 29 through which a physician inserts a guide wire (not shown) to guide catheter 20 to the desired location in a patient's body. *Id.* Electrical arcs between electrodes 22, 24 generate shockwaves in the fluid. *Id.* The magnitude of the shockwaves is controlled by altering the voltage, current, duration, and frequency of the signal sent from pulse generator 30 to electrodes 22, 24. *Id.* ¶ 52.

Hawkins '768 illustrates one embodiment of its electrodes in the colorized version of Figure 15 (reproduced in pertinent part at right). Petitioner contends that the surface area of electrode 114 (green) is larger than the surface area of electrode 112 (red). Pet. 25. Electrode 114 is configured as a parabolic reflector, and electrode 112 is positioned at the coaxial center of reflector 114. Ex. 1003 ¶ 64. The parabolic shape of electrode 114 focuses shockwave energy in a desired direction. *Id.*



c) *Kunis*

Kunis is directed to “catheters and methods for performing targeted tissue ablation.” Ex. 1005, 1:12–13. Kunis’s device treats heart arrhythmia by ablating specific portions of heart tissue to correct the manner in which electrical signals propagate through that tissue. *Id.* at 1:20–31. An array of multiple electrodes simultaneously or serially deliver electrical ablation energy to targeted tissue over a relatively large area. *Id.* at 5:18–27, 7:53–58. Kunis also describes delivering ablation energy as acoustic, electromagnetic, thermal, or mechanical energy, and combinations of those types of energy. *Id.* at 25:29–36. Kunis indicates that its electrodes may be “electrically connected in parallel, in series, individually, or combinations” of these types of connections. *Id.* at 25:41–42. Kunis also indicates that, for devices “with large numbers of electrodes, individual pairs of wires for each electrode may be bulky and compromise the cross-sectional profile of the ablation catheter.” *Id.* at 25:59–62. Kunis suggests serially connecting the

electrodes to reduce the number of wires to avoid undesirable bulk and shrink the cross-sectional profile of the device. *Id.* at 25:62–65.

2. *Claim 1*

a) *Petitioner’s Argument and Evidence*

Petitioner relies upon Hawkins ’020 as expressly describing every limitation of claim 1 except for aspects of elements 1e and 1g. Pet. 23–24, 30–39. Petitioner contends that the individual electrodes of Hawkins ’020 “necessarily have different surface areas” as required in element 1e. *Id.* at 32–34 (citing Ex. 1004 ¶ 28, Figure 3; Ex. 1002 ¶ 70⁸). Petitioner alternatively relies upon Hawkins ’768 as demonstrating that electrode pairs in which each electrode has a different surface area (element 1e) was a well-known configuration. *Id.* at 24–26. Petitioner recognizes that Hawkins ’020 may not expressly describe whether its electrodes are connected in a serial or parallel arrangement, but contends that it would have been obvious to “try either a series or a parallel connection” between the two pairs of electrodes largely because an ordinarily skilled artisan would have understood that series and parallel connections were the two options for connecting “adjacent and commonly driven electrode pairs.” *Id.* at 26–27 (citing Ex. 1002 ¶¶ 53–64, 76–79). Petitioner further relies upon Kunis as expressly suggesting serially connecting commonly driven electrode pairs to reduce the bulk, stiffness, and cross-sectional profile of intravascular medical devices using such electrode pairs. *Id.* at 28–29, 37–39 (citing Ex. 1005, 5:18–37, 25:38–42, 25:59–67, Figure 17b; Ex. 1002 ¶¶ 53–64, 76–79).

⁸ Based on our review of Dr. Jensen’s testimony, it is readily apparent that Petitioner intended to cite paragraph 70 rather than paragraph 71.

b) Analysis of Patent Owner's Counterarguments

Patent Owner argues that Petitioner's challenge to claim 1 fails for three reasons, Prelim. Resp. 26–42, none of which is persuasive on the current record.

(1) Series of Arc-generating Gaps

Patent Owner argues that the asserted prior art fails to describe providing two arc-generating gaps arranged in series in the same conductive medium. *Id.* at 26–35. Patent Owner argues that an ordinarily skilled artisan would understand that electrodes can be wired in ways other than parallel or series and posits other such potential ways. *Id.* at 26. Petitioner cites evidence to support its contention that only series and parallel configurations of electrodes are possible, Pet. 26–27 (citing Ex. 1002 ¶¶ 53–64, 76–79), while Patent Owner cites no evidence to support its contentions otherwise, Prelim. Resp. 26. Accordingly, Petitioner's argument is more persuasive at this stage of the proceeding.

Patent Owner also contends that Hawkins '020 describes only a parallel arrangement of its electrodes. *Id.* at 26–27. Patent Owner relies upon the way in which a provisional application allegedly incorporated by reference in the '673 patent describes the manner of connecting “each of the electrodes to the voltage supply or to ground.” *Id.* (citing Ex. 1009, Figures 2, 3, 5–9, and 14). We note that the provisional application wholly fails to describe either a series or parallel relationship among more than one pair of electrodes because only one electrode pair is incorporated into its balloon catheter. Ex. 1009, Figures 2, 3, 5–9, and 14. Therefore, Patent Owner's citation to the provisional application is of no relevance to the issue of how electrode pairs 34, 36 of Hawkins '020 are wired. Patent Owner

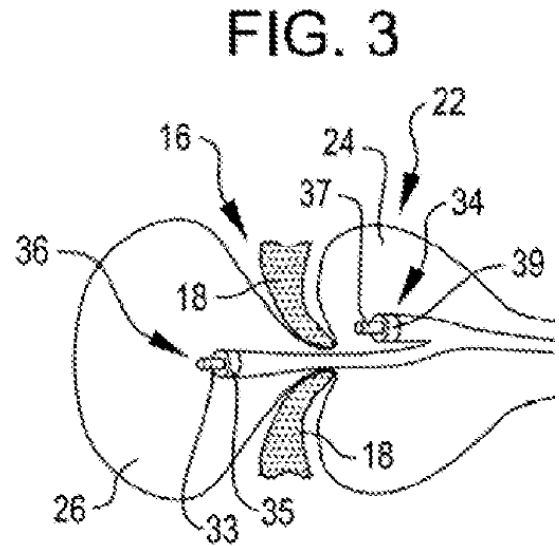
contends that Figure 3 of Hawkins '020 “shows that the Hawkins '020 device electrodes are wired in parallel, not series” and supplies a “diagram of the equivalent circuit for Hawkins '020” to bolster its contention. Prelim. Resp. 27–29. Neither Patent Owner’s “analysis” of Hawkins '020 nor its “equivalent circuit” is supported by testimony. *Id.* We, therefore, consider Patent Owner’s contention to be merely argument by its attorneys that is currently unsupported by evidence.

Patent Owner dismisses the significance of Kunis as failing to “disclose the floating electrode architecture recited in the claims,” but similarly fails to support its argument with any testimonial evidence. *Id.* at 31–32. Although Patent Owner purports to analyze Kunis, Patent Owner fails to address the express teachings of Kunis that Petitioner relies upon. *Id.* (failing to address teachings at Ex. 1005, 5:18–37, 25:38–42, 25:59–67). For example, Kunis expressly states that its “ablation elements can be electrically connected in parallel, series, individually, or combinations thereof.” Ex. 1005, 25:41–42. Kunis also provides reasons, e.g., avoiding bulky configurations and reducing the cross-sectional profile, for using a series connection instead of a parallel connection. *Id.* at 25:59–65. Patent Owner fails to address these specific teachings by Kunis, which Petitioner relies upon. Prelim. Resp. 31–32. Based on Petitioner’s showing, we are persuaded that the combined teachings of Hawkins '020 and Kunis would have suggested the “floating architecture” that Patent Owner contends to be recited in the claims.⁹

⁹ Patent Owner appears to rely upon the language identified by Petitioner as element 1g as reciting the “floating architecture” of the electrodes. Prelim. Resp. 33. Patent Owner indicates that a “floating” electrode is one that is “not connected to either ground or a voltage source.” *Id.* at 6 (citing

(2) *Electrodes of Different Sizes*

Patent Owner argues that Hawkins '020 fails to describe electrodes of different sizes. *Id.* at 36–37. Patent Owner contends that Petitioner improperly relies upon Figure 3 of Hawkins '020 (reproduced at right in pertinent part). *Id.* at 36. Patent Owner argues that Figure 3 cannot be relied upon as illustrating electrodes 35 and 39 as having a larger surface area than the



corresponding electrodes 33 and 37 respectively because the figure is not drawn to scale. *Id.* at 36–37 (citing *Hockerson-Halberstadt, Inc. v. Avia Group Int'l*, 222 F.3d 951, 956 (Fed. Cir. 2000) (“[I]t is well established that patent drawings do not define the precise proportions of the elements and may not be relied on to show particular sizes if the specification is completely silent on the issue.”)). Patent Owner’s argument is unpersuasive.

First, even when patent drawings are not drawn to scale, they may be used to establish relative sizes and relationships between the various components which are clearly depicted in those drawings. *See, e.g., Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1565 (Fed. Cir. 1991). To the extent

Ex. 1001, 11:19–26). Patent Owner also appears to imply that element 1g requires a configuration in which individual arcs sequentially jump across each of the first and second electrode pairs. *Id.* at 33–35 (criticizing Jensen testimony). To the extent that Patent Owner contends that the claims recite the floating architecture or a device that sequentially generates arcs, it should precisely identify in its Patent Owner Response the language within the claim that recites such requirements and proffer any evidence that supports its interpretation of that language.

that Petitioner relies upon Figure 3 of Hawkins '020, it does so to establish the relative size of each electrode within each pair as permitted under *Vas-Cath*. Second, Petitioner also relies on the following text from Hawkins '020 regarding the relative sizes of the electrodes: “electrode pair 36 is at the distal end of a first cable and comprises a center conductor 33 and an outer conductive shield 35. Similarly, electrode pair [34] is at the distal end of a second cable and comprises a center conductor [37] and an outer conductive shield [39].” Pet. 33 (quoting Ex. 1004 ¶ 28¹⁰). Based on this text, Petitioner argues that an ordinarily skilled artisan would understand that the radially innermost portions of electrode pairs 36, 34 (i.e., center conductors 33, 37 respectively) have a smaller surface area than radially outermost portions of electrode pairs 36, 34 (i.e., conductive shields 35, 39 respectively). *Id.* Dr. Jensen testifies in support of this understanding and opines that the radially innermost and outermost conductors of each electrode pair will “necessarily have different surface areas.” Ex. 1002 ¶ 70.¹¹ On the current record, Petitioner persuades us that Hawkins '020 describes electrodes of different sizes within each electrode pair as recited in element 1e of claim 1.

(3) Motivation and Ability to Combine Hawkins '020 with Hawkins '768

Patent Owner argues that Petitioner fails to establish that an ordinarily skilled artisan would have been motivated, or understood how, to combine the reflector electrode arrangement of Hawkins '768 with the coaxial

¹⁰ The actual text from Hawkins '020 appears in brackets as necessary to correct errors in Petitioner's quotation from Hawkins '020.

¹¹ Petitioner mistakenly cites paragraph 71 of Exhibit 1002. Pet. 34.

electrode arrangement of Hawkins '020 system. *Id.* at 38–42. More specifically, Patent Owner argues that Petitioner fails to provide any rationale for why an ordinarily skilled artisan would have been motivated to modify the electrodes of Hawkins '020 with the parabolic reflector of Hawkins '768. *Id.* at 38–39. Petitioner contends only that an ordinarily skilled artisan would have considered the coaxial electrodes of Hawkins '020 and Hawkins '768 to be “interchangeable design choice and would have the skill and background knowledge to modify the electrode of Hawkins '020 with the electrode of Hawkins '768 to provide for the relative surface area limitation.” Pet. 25–26, 34–35 (citing Ex. 1002 ¶¶ 72–73). Dr. Jensen cites no objective evidence to support his opinion. Ex. 1002 ¶ 72. However, Patent Owner provides no testimonial evidence to counterbalance Dr. Jensen’s opinion that the types of electrodes are interchangeable. On balance, we consider Petitioner’s uncontroverted showing to be sufficiently persuasive at this stage of the proceeding.

We also note that, as discussed in Part II.D.2.b)(2) above, we are persuaded that Petitioner need not rely upon any teachings from Hawkins '768 to demonstrate that electrodes of different sizes were known in the prior art.

Patent Owner also argues that Petitioner fails to explain “how the parabolic reflector structure [of Hawkins '768] even *could* be incorporated into the Hawkins '020 structure.” Prelim. Resp. 40. “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413,

425 (CCPA 1981) (citations omitted). Dr. Jensen testifies that an ordinarily skilled artisan would have the skill and background knowledge to modify Hawkins '020 as proposed. Ex. 1002 ¶ 72. Patent Owner cites no testimony to support its argument otherwise. Prelim. Resp. 40–41. As above, we consider Petitioner's uncontroverted showing to be sufficiently persuasive at this stage of the proceeding.

c) Conclusion

For the reasons expressed above, we conclude that Petitioner has demonstrated a reasonable likelihood of proving that claim 1 is unpatentable as obvious in view of the combined teachings of Hawkins '020, Hawkins '768, and Kunis.

3. Remaining Claims 2, 5–8, 15, 16, 19, and 20

Patent Owner does not separately address Petitioner's challenges to any of the claims that ultimately depend from claim 1 (claims 2 and 5–8) or independent claim 15 and its dependent claims 16, 19, and 20. *See* Prelim. Resp. 24–43 (addressing only the challenge to claim 1). Based on our review of the Petition as it relates to these claims, Pet. 39–43, 52–57, 61–63, 65, we determine that Petitioner has demonstrated a reasonable likelihood of proving that these claims are also unpatentable as obvious in view of the combined teachings of Hawkins '020, Hawkins '768, and Kunis.

4. Conclusion

For the reasons expressed above, we determine that Petitioner has demonstrated a reasonable likelihood of proving that claims 1, 2, 5–8, 15, 16, 19, and 20 are unpatentable as obvious in view of the combined teachings of Hawkins '020, Hawkins '768, and Kunis.

E. OBJECTIVE INDICIA OF NON-OBVIOUSNESS

Patent Owner argues that Petitioner “should address objective evidence of nonobviousness known to it prior to filing the petition.” Prelim. Resp. 44 (citing *Praxair Distribution, Inc. v. Mallinckrodt Hospital Prods.*, Cases IPR2016-00777, IPR2016-00778, IPR2016-00779, IPR2016-00780, slip. op. 8–10 (PTAB Sept. 22, 2016) (Paper 10)). Patent Owner contends that Petitioner “is Shockwave’s primary competitor” and “thus surely knew about most if not all the objective evidence of nonobviousness discussed” in the Preliminary Response. *Id.* (citing Ex. 2006, 6, 23). The evidence cited does not support the proposition for which Patent Owner offers it.

Exhibit 2006 is a Wells Fargo Securities report explaining Wells Fargo’s “price target” for shares in Patent Owner. Ex. 2006, 1. The cited portions merely identify Petitioner as the filer of this Petition and others challenging Patent Owner’s patents, *id.* at 6, or the maker of one competing atherectomy device, *id.* at 23. The Wells Fargo report never characterizes Petitioner as “Shockwave’s primary competitor.” Even if it did, the report may be inadmissible hearsay for that proposition.

Additionally, Patent Owner presents no admissible evidence of Petitioner’s subjective knowledge of Patent Owner’s purported objective evidence of non-obviousness.¹² Patent Owner recognizes its own failure to supply such evidence by equivocally arguing that Petitioner “surely knew” about “most if not all” of Patent Owner’s evidence. Prelim. Resp. 44. We will not deny the Petition on the current record because Petitioner is entitled

¹² A variety of fundamental evidentiary problems exist with the Wells Fargo report when offered to prove Petitioner’s subjective knowledge that virtually nullify its probative value on that point.

to an opportunity to meet Patent Owner's evidence of non-obviousness in a trial setting.

For similar reasons, we do not weigh the evidence adduced by Patent Owner directly relating to purported objective indicia of non-obviousness. *See id.* at 18–23 (discussing industry praise for the invention). Petitioner is entitled to address the evidence adduced by Patent Owner during the trial. When the record regarding objective indicia of non-obviousness is complete, we will weigh the evidence as part of our consideration of Petitioner's challenges.

III. CONCLUSION

For the reasons expressed above, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 1, 2, 5–8, 15, 16, 19, and 20 of the '673 patent are unpatentable as obvious. In accordance with the Court's decision in *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018) and Office guidance, we institute an *inter partes* review of all challenged claims of the '673 patent on all grounds of unpatentability alleged by Petitioner.

IV. ORDER

For the reasons given, it is:

ORDERED that *inter partes* review is instituted of claims 1–20 of the '673 patent with respect to all grounds of unpatentability set forth in the Petition;

FURTHER ORDERED that *inter partes* review is not instituted with respect to any other grounds of unpatentability alleged in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '673 patent is instituted commencing on the entry date

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of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4,
notice is given of the institution of a trial.

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Patent 9,642,673 B2

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