

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WAGNER SPRAY TECH CORPORATION,
Petitioner,

v.

GRACO MINNESOTA INC.,
Patent Owner.

Case PGR2018-00049
Patent 9,675,982 B2

Before LINDA E. HORNER, MICHAEL L. WOODS, and
SEAN P. O'HANLON, *Administrative Patent Judges*.

WOODS, *Administrative Patent Judge*.

DECISION
Denying Institution of Post-Grant Review
37 C.F.R. § 42.208

I. INTRODUCTION

Wagner Spray Tech Corporation (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting post-grant review of all claims (claims 1–17) of U.S. Patent No. 9,675,982 B2 (Ex. 1001, “the ’982 patent”). Pet. 7; Ex. 1001, 7:64–10:45. Graco Minnesota Inc. (“Patent Owner”) filed a preliminary response (Paper 9, “Prelim. Resp.”) to the Petition.

A post-grant review may not be instituted unless “the information presented in the petition filed under section 321, if such information is not rebutted, would demonstrate that it is more likely than not that at least 1 of the claims challenged in the petition is unpatentable.” 35 U.S.C. § 324(a). For the reasons set forth below, the Petition fails to demonstrate that it is more likely than not that any of the challenged claims is unpatentable. Accordingly, we do not institute post-grant review of any claim of the ’982 patent.

A. Related Proceedings

The parties represent that there are no related matters before the Board or in a Federal Court. Pet. 8; Paper 3, 1. The parties represent, however, that the parent application to the ’982 patent (U.S. Application No. 15/022,044) is still pending before the Office. Pet. 8; Paper 3, 1.

B. The ’982 Patent (Ex. 1001)

The ’982 patent is entitled “Spray Tip and Method of Manufacture” and describes a spray tip for use in paint spraying, for example. Ex. 1001, [54], 1:19–25. In particular, the ’982 patent states that its spray tip improves

the uniformity of a spray pattern by *increasing the turbulence* of the fluid (e.g., paint). *See id.* at 3:53–57. By increasing the turbulence, the '982 patent describes that undesirable “tails” or high concentration of fluid at the fringe of the spray pattern is reduced. *See id.* at 3:57–60. To illustrate an embodiment of the '982 patent, we reproduce Figure 2, below:

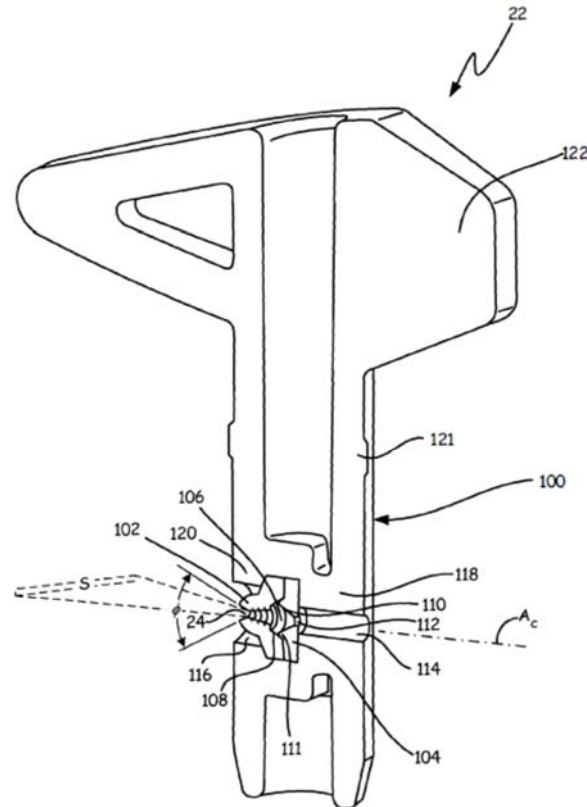


FIG. 2

According to the '982 patent, Figure 2 illustrates a cross-sectional perspective view of a spray tip. Ex. 1001, 2:4–5. Specifically, Figure 2 depicts spray tip 22 with tip body 100, tip piece 102, and pre-orifice piece 104. *Id.* at 3:15–17. Tip piece 102 and pre-orifice piece 104 include chamber surfaces 108 and 110 that define turbulating chamber 106. *Id.* at

3:17–19. To illustrate particular turbulating features that are at issue in this decision, we reproduce Figure 3A, below (*see id.* at 3:63–65):

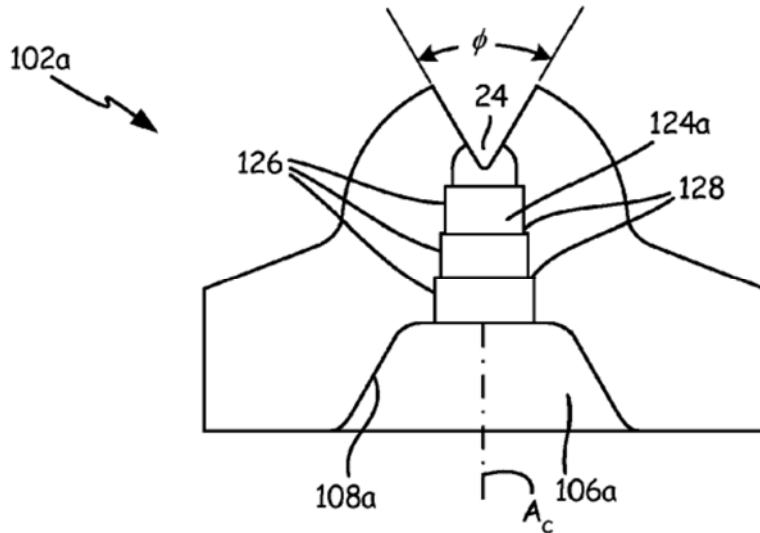


FIG. 3A

Figure 3A depicts a cross-sectional view of one of three alternative embodiments of the '982 patent's tip piece, denoted here as tip piece 102a. *Id.* at 4:20–22. As shown above, tip piece 102a depicts outlet passage 124a with a plurality of cylindrical sections, denoted as 126, with steps 128 converging from turbulating chamber 106a to outlet orifice 24. *Id.* at 4:30–33. Figure 3A also depicts turbulating chamber 106a as having a conical or frustoconical wall at chamber surface 108a. *Id.* at 4:33–35. Cylindrical sections 126 and steps 128 “*further turbulate fluid flow from turbulating chamber*” 106a to its outlet aperture, thereby reducing pressure loss across outlet orifice 24. *Id.* at 4:36–38 (emphasis added).

C. Illustrative Claim

Claims 1, 16, and 17 are independent, with claims 2–15 depending directly or indirectly from claim 1. Ex. 1001, 7:64–10:45. We reproduce

claim 1, below, with emphases added to limitations discussed in this Decision:

1. A spray tip for atomizing a fluid in a spray, the spray tip comprising:

a tip body, the tip body having a cylindrical portion having an exterior circumference, the cylindrical portion having an aperture that extends through the cylindrical portion, the aperture having a pair of openings respectively located on opposite sides of the exterior circumference, wherein the fluid moves through the aperture in an upstream to downstream orientation;

a pre-orifice piece located in the aperture of the tip body, the pre-orifice piece having an inlet passage and a chamber section, the inlet passage located upstream of the chamber section, the inlet passage is narrower than the chamber section; and

a *tip piece* located in the aperture of the tip body downstream of the pre-orifice piece and *abutting the pre-orifice piece*, the tip piece having a stepped section and an outlet aperture, the outlet aperture downstream of the stepped section, the outlet aperture is narrower than the stepped section, the *stepped section comprising a plurality of cylindrical steps*, the plurality of cylindrical steps arranged sequentially converging from widest upstream and narrowing downstream toward the outlet aperture,

wherein the pre-orifice and the tip piece together form a turbulating chamber that is located between the inlet passage and the outlet aperture and the fluid flows through each of the inlet passage, the chamber section, and the stepped section before being released through the outlet aperture as the spray, and

wherein the tip piece and the pre-orifice piece fully define the turbulating chamber, *the chamber section of the pre-orifice piece has an upstream frustoconical surface* that widens in a downstream direction and that defines an upstream portion of the turbulating chamber, and the tip piece has a downstream frustoconical surface of the turbulating chamber that narrows in the downstream direction and that defines a downstream portion of the turbulating chamber.

Id. at 7:64–8:36 (emphases added).

D. Relied-Upon Art

Name	Reference	Ex. No(s).
Carey	U.S. Pat. No. 5,749,528, issued May 12, 1998	1005
Torntore	U.S. Pat. No. 5,505,381, issued Apr. 9, 1996	1006
Calder	U.S. Pat. No. 4,074,857, issued Feb. 21, 1978	1007
Johnson	U.S. Pat. Pub. No. 2012/0298771 A1, published Nov. 29, 2012	1008
Liska	U.S. Pat. No. 6,264,115 B1, issued July 24, 2001	1009
UMN	Petitioner’s reference to “UMN” is to three separate exhibits that relate to a mechanical engineering student design show at the University of Minnesota in 2013.	1010, 1018, and 1019
Leisi	U.S. Pat. Pub. No. 2004/0195354 A1, published Oct. 7, 2004	1011
TeeJet	Dultmeier Sales Liquid Handling Catalog, 2013	1012

E. Alleged Grounds of Unpatentability

Petitioner contends that claims 1–17 of the ’982 patent are unpatentable under the following grounds:

Ground	Basis	Prior Art	Claim(s)
1	§ 103	Carey, Torntore, Calder, and Johnson	1–17
2	§ 103	Liska, Torntore, and Johnson	1–17
3	§ 103	Johnson and UMN	1–5, 9–12, 16, and 17
4	§ 103	Johnson, UMN, and Leisi	6–8, 14, and 15
5	§ 103	Johnson, UMN, and TeeJet	13

Pet. 9. Petitioner also submits the declaration testimony of Dr. Pinhas Ben-Tzvi (Ex. 1002) in support of the grounds. *See, e.g.*, Pet. 5. Patent Owner submits the declaration testimony of Dr. Charles Garris (Ex. 2001) in rebuttal. *See, e.g.*, Prelim. Resp. v.

II. ANALYSIS

A. POSITA

Petitioner proposes that a person having ordinary skill in the art (“POSITA”) would have had

at least a bachelor’s degree in mechanical engineering, or a similar field, and two to four years of experience in design of fluidic devices that are made to generate micro-droplets through pneumatic, thermal or electrical actuation or a mechanical technician with an engineering diploma with 4-6 years of actual working experience in spray guns.

Pet. 21 (citing Ex. 1002, 8–9).

Patent Owner’s declarant proposes a similar level of skill. Ex. 2001 ¶ 13.

For purposes of this Decision, we adopt Petitioner’s proposed level of ordinary skill in the art.

B. Claim Construction

In a post-grant 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. § 42.200(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). “Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016).

For purposes of this Decision, we determine that no claim term requires express construction to resolve this controversy. *See Wellman, Inc.*

v. Eastman Chem. Co., 642 F.3d 1355, 1361 (Fed. Cir. 2011) (holding that “claims terms need only be construed to the extent necessary to resolve the controversy”) (internal quotation marks omitted).

C. Ground 1: Carey, Torntore, Calder, and Johnson

Petitioner submits that claims 1–17 are unpatentable over Carey, Torntore, Calder, and Johnson. Pet. 21.

1. Carey (Ex. 1005)

Carey is entitled “Reversible Spray Tip” and discloses a spray tip and nozzle for use with a liquid spray gun, such as a paint gun. Ex. 1005, [54], [57]. We reproduce Figure 4 of Carey, below, to illustrate an embodiment of Carey’s spray tip discussed in this Decision:

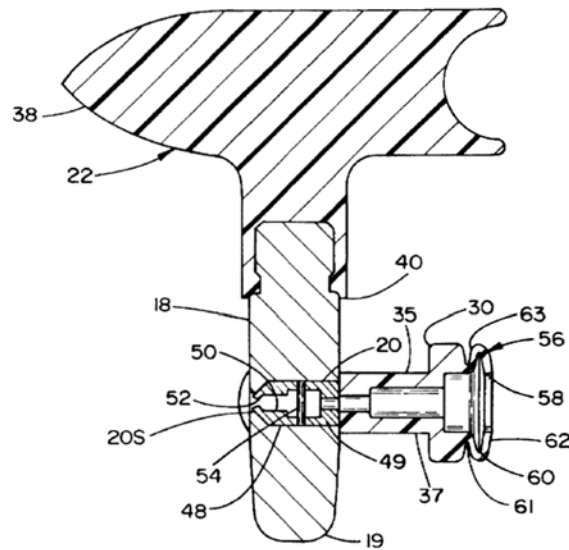
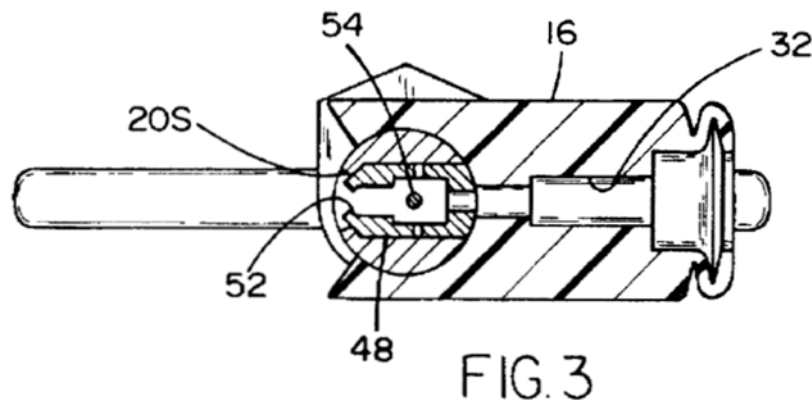


FIG. 4

According to Carey, Figure 4 depicts a cross-sectional view of a reversible spray tip unit. *Id.* at 2:52–54. In particular, Figure 4 depicts spray tip insert 48 press-fitted into bore 20. *Id.* at 4:17–20. Spray orifice 52 of

insert 48 is positioned at forward end 20S of bore 20 and downstream of diffuser pin 54. *Id.* at 4:21–24. Diffuser pin 54 ensures that when spray tip 10 is reversed for the purpose of dislodging material clogging orifice 52, high pressure fluid exiting from fluid bore 50 opposite orifice 52 does not do so as a solid stream. *Id.* at 4:25–28. Diffuser holder 49 is also press-fitted into bore 20 behind diffuser pin 54 to maintain pin 54 transversely in bore 20. *Id.* at 4:28–31. Preferably, the end of insert 48 includes diametrically-opposed recesses 51, 53 in which diffuser pin 54 nests or seats, to thereby prevent movement of pin 54 as fluid passes. *Id.* at 4:31–34. To further illustrate pin 54 positioned between insert 48 and diffuser holder 49, we reproduce Carey’s Figure 3, below:



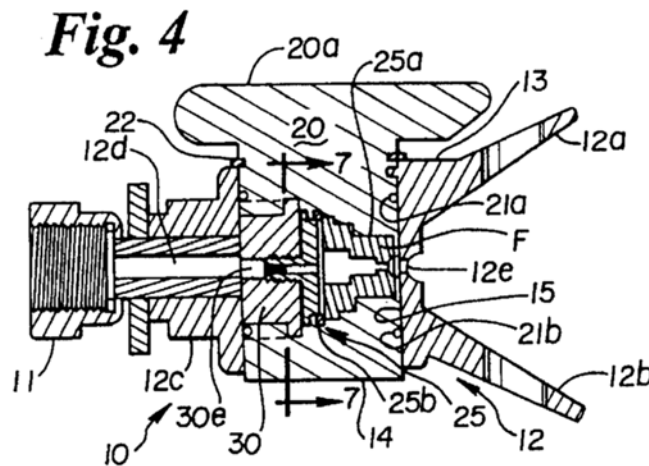
Carey’s Figure 3 depicts a different cross-sectional view of Carey’s reversible spray tip that is perpendicular to the cross-sectional view shown in Figure 4. *See id.* at 2:46–54, Fig. 2. As can be seen in Figure 3, pin 54 is positioned between insert 48 and holder 49 (not numbered in Figure 3), and a space exists between insert 48 and holder 49. *See also id.* at Fig. 4 (depicting pin 54 positioned between insert 48 and holder 49).

Accordingly, Carey describes pin 54 as being held between insert 48 and diffuser holder 49 such that insert 48 and holder 49 are not in direct

contact with one another.

2. Torntore (Ex. 1006)

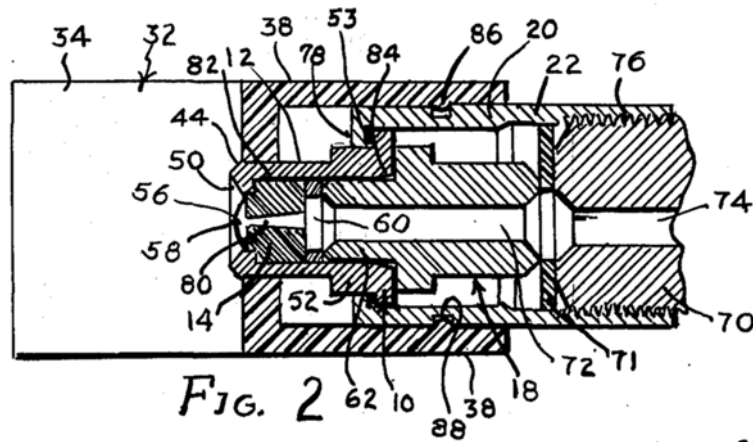
Torntore is entitled “Rotatable, Cleanable, Flat Tip Holder for Airless Spraying” and describes a spray system for attachment to an airless spray gun and a rotatable flat tip holder. Ex. 1006, [54], [57]. To illustrate an embodiment of Torntore’s flat tip holder, we reproduce Figure 4, below:



According to Torntore, Figure 4 depicts a cross-sectional view of its tip holder. *See id.* at 2:19–26. In particular, Figure 4 depicts receiving passage 25 positioned within tip holder 20, with first tip receiving area 25a formed to accommodate the exterior shape of tip F. *See id.* at 3:9–14.

3. Calder (Ex. 1007)

Calder is entitled “Reversible Spray Tip” and discloses a tip assembly for use in airless spray equipment. Ex. 1007, [54], 1:12–13. To illustrate an embodiment of Calder’s spray tip assembly, we reproduce its Figure 2, below:



According to Calder, Figure 2 depicts spray tip assembly 10 with barrel member 12, spray tip member 14, sealing member 16, and generally cylindrical plug member 18. *See id.* at 2:39–43 (referencing Fig. 1).

4. Johnson (Ex. 1008)

Johnson is entitled “Airless Spray Tip” and depicts its tip assembly in Figure 2, reproduced below:

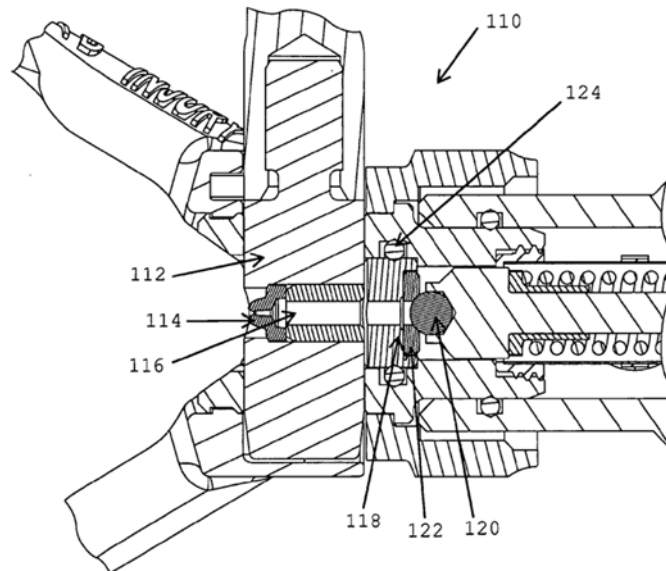


FIG. 2

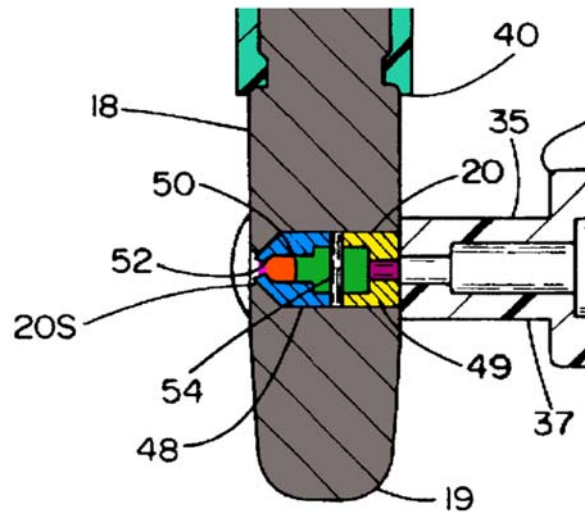
According to Johnson, Figure 2 depicts Johnson's tip assembly including cylinder 112 with tip 114 at one end of dead zone 116. Ex. 1008,

[54], ¶¶ 6, 8.

5. Petitioner's Challenge

a. Turbulating Chamber

Claim 1 requires, *inter alia*, a spray tip comprising a tip body, a pre-orifice piece, and a tip piece, wherein the pre-orifice piece and the tip piece form a turbulating chamber. Ex. 1001, 7:64–8:36. To address these limitations, Petitioner references an examiner's *office action* (Ex. 1003, "Office Action") and asserts that "Carey teaches a majority of the claim language including: the tip body, tip piece, pre-orifice piece, and turbulating chamber." Pet. 26 (citing Ex. 1003, 4). To illustrate these teachings, Petitioner submits a partially-annotated view of Carey's Figure 2 (*id.* at 22), which we reproduce below.

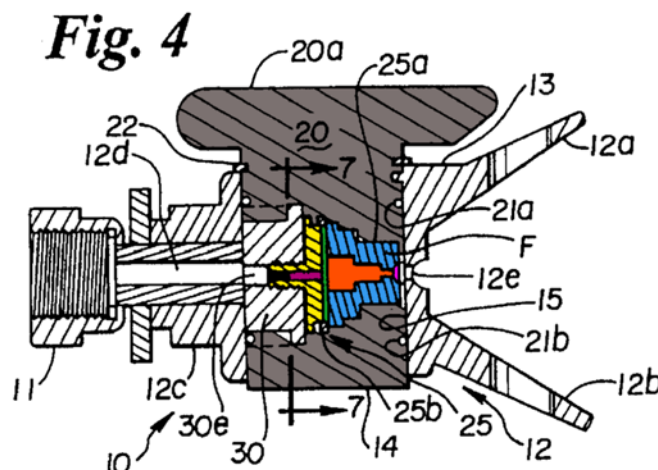


Petitioner's reproduction of Carey Figure 2 is annotated to show various components in differing colors. According to Petitioner, Carey's "pre-orifice piece" 49 (yellow) and "tip piece" 48 (blue) are press-fit to maintain the position of pin 54. See *id.*

Petitioner further asserts that Patent Owner did not challenge the examiner's rejections based on Carey, Torntore, and Calder, and that the motivation to combine these references is "still valid." *See id.* at 25–26 (citing Ex. 1003, 7; Ex. 1025, 9). Petitioner relies on an examiner's prosecution rejection and reasons that it would have been obvious to modify Carey to satisfy several other limitations, which we address separately, below. *See id.* at 26–28.

b. Plurality of Steps

Claim 1 also requires the "tip piece" to have "a stepped section . . . comprising a plurality of cylindrical steps . . . arranged sequentially converging from widest upstream and narrowing downstream toward the outlet aperture." Ex. 1001, 8:14–21 (emphasis added). Petitioner acknowledges that Carey does not teach a plurality of steps, and relies on Torntore for teaching this limitation. *See* Pet. 26 (citing Ex. 1003, 4) ("[t]he Office Action noted that Carey, while having one step, did not have a plurality of steps."). Petitioner submits a partially-annotated view of Torntore's Figure 4 (*id.* at 23), which we reproduce below:



Petitioner's reproduction of Torntore Figure 4 is annotated to show various components in differing colors. According to Petitioner, and as shown above in Figure 4, "tip piece" F (blue) comprises a stepped section (orange), immediately preceding the outlet aperture (pink). *Id.*; *see also id.* at 10, n.1 ("Coloration will be consistently used throughout this petition for clarity").

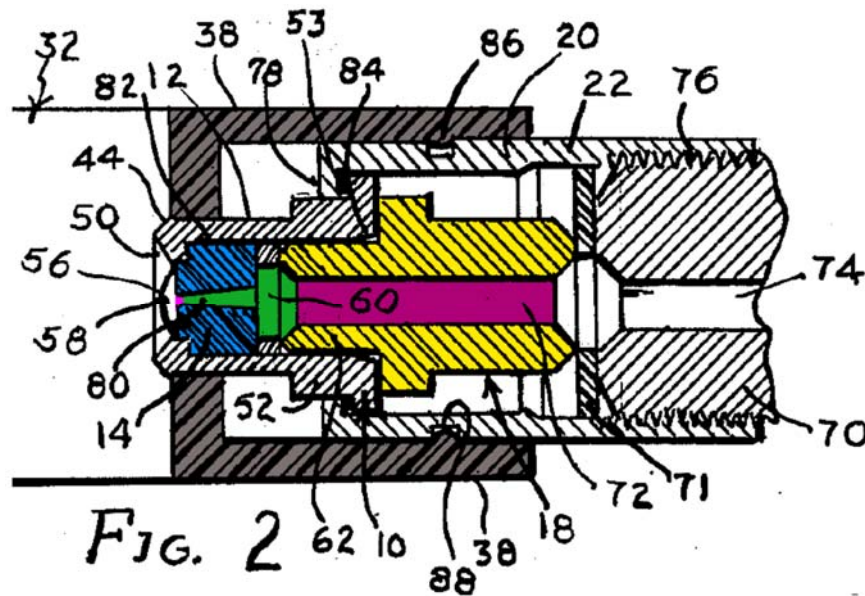
In modifying Carey to include Torntore's "plurality of steps," Petitioner quotes the examiner's modification from the Office Action, which reads:

it would have been obvious to one of ordinary skill in the art at the time of the invention to use a plurality of steps as taught by Torntore to [sic] the structure of Carey since a plurality of more gradual steps is known to moderate the flow rate change and as a result provide a more consistent spraying output while still increasing the speed.

Id. at 26 (quoting Ex. 1003, 4–5).

c. Frustoconical Surface

Claim 1 further requires that "the turbulating chamber . . . section of the pre-orifice piece has an upstream frustoconical surface that widens in a downstream direction and . . . the tip piece has a downstream frustoconical surface of the turbulating chamber that narrows in the downstream direction." Ex. 1001, 8:28–36. To satisfy the claimed frustoconical surfaces, Petitioner relies on Calder for disclosing a tip piece and a pre-orifice piece with frustoconical surfaces (Pet. 26) and submits a partially-annotated view of Calder's Figure 2 (*id.* at 24), which we reproduce below:



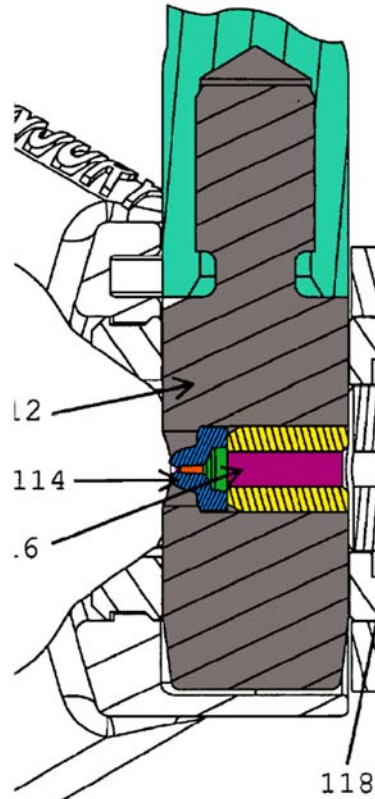
Petitioner's reproduction of Calder's Figure 2 is annotated to show various components in differing colors. According to Petitioner, Calder's Figure 2 depicts a turbulating chamber (green) defined by conical/tapered sections on both tip piece 14 (blue) and pre-orifice piece 18 (yellow). See *id.*

In further modifying Carey and Torntore with the teachings of Calder, Petitioner again refers to the Office Action and reasons that “it would have been obvious to one of ordinary skill in the art at the time of the invention to have a conical shaped upstream section of the turbulating chamber [...] since it would allow for easier machining [...] as well as smoother transition to turbulence and pressure increases.” *Id.* at 26–27 (quoting Ex. 1003, 7) (citing Ex. 1002, 27–28).

d. Abutment

Claim 1 further recites the “tip piece . . . abutting the pre-orifice piece.” Ex. 1001, 8:11–13. To meet the claimed limitation, Petitioner again

cites to an examiner's rejection and relies on Johnson's teaching of abutment. See Pet. 28 (citing Ex. 1004, 6–7) (“[a]s noted by the Examiner . . . Carey teaches a majority of the language recited . . . except for the abutment.”). Petitioner submits an annotated version of Johnson's Figure 2 (*id.* at 25), which we reproduce below:



Petitioner's reproduction of Johnson's Figure 2 is annotated to show various components in differing colors. According to Petitioner, and as shown in Johnson's Figure 2, above, the pre-orifice piece (yellow) abuts tip piece 114 (blue). See *id.* at 25; see also *id.* at 27 (“Johnson does teach abutment of the tip piece and the pre-orifice piece.”).

In further modifying Carey to include Johnson's “abutment,” Petitioner reproduces a portion of the Office Action that reads:

it would have been obvious to one of ordinary skill in the art at

the time of the invention to abut and insert the pre-orifice piece with the tip piece since it would allow *removal of an interstitial seal* which would allow for a *smooth transition* between the components as well as an easier assembly feature (by inserting and therefore abutting, this would be *easier to assemble* than holding 3 floating pieces together).

Pet. 27 (quoting Ex. 1003, 8) (emphases added).

6. Our Analysis

In contesting Petitioner’s Ground 1 challenge, Patent Owner argues that the Petitioner has failed to show that a POSITA would have been motivated to combine the references in the manner claimed. Prelim. Resp. 29. We agree.

As set forth above, Petitioner proposes to modify Carey to include Torntore’s “plurality of steps” (Pet. 26), Calder’s “frustoconical surfaces” (*id.* at 26–27), and Johnson’s “abutment” (*id.* at 27–28), but provides inadequate reasoning in making the proposed combinations.

First, in proposing to modify Carey to include Torntore’s “plurality of steps,” Petitioner simply reproduces the examiner’s reasoning from the earlier Office Action in stating that “since a plurality of more gradual steps is known to moderate the flow rate change and as a result provide a more consistent spraying output while still increasing speed.” Pet. 26 (citing Ex. 1003, 4–5). Upon reviewing the Petition and the cited Office Action, however, we find inadequate evidentiary support for the proposition that gradual steps were known at the time of the invention to moderate flow rate change, thereby providing more consistent spraying output while still increasing speed. Although Dr. Ben-Tzvi testifies—repeating verbatim—the

reasoning provided in the Petition (*compare* Pet. 26, with Ex. 1002, 27), the testimony does not disclose the underlying facts or data on which the opinion is based, so it is entitled to little or no weight (*see* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”)). Furthermore, even if we assume that Torntore’s Figure 4 depicts cylindrical steps, we find nothing in Torntore that describes, let alone explains, the purpose of these “steps.” It is not enough to simply cite to the examiner’s reasoning, especially if the examiner’s reasoning itself is without evidentiary support or explanation. Here, Petitioner has failed to provide adequate articulated reasoning with rational underpinning to support its legal conclusion of obviousness. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). Accordingly, we are not persuaded that a POSITA would have modified Carey to include Torntore’s “plurality of steps,” as Petitioner proposes.

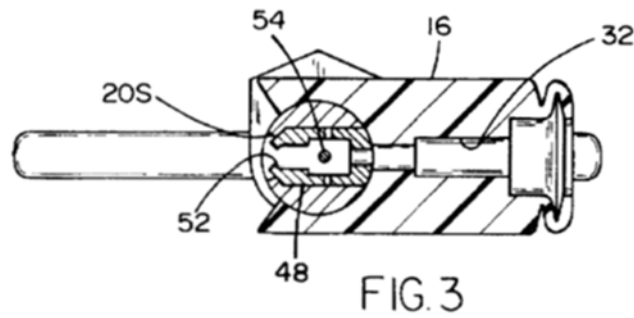
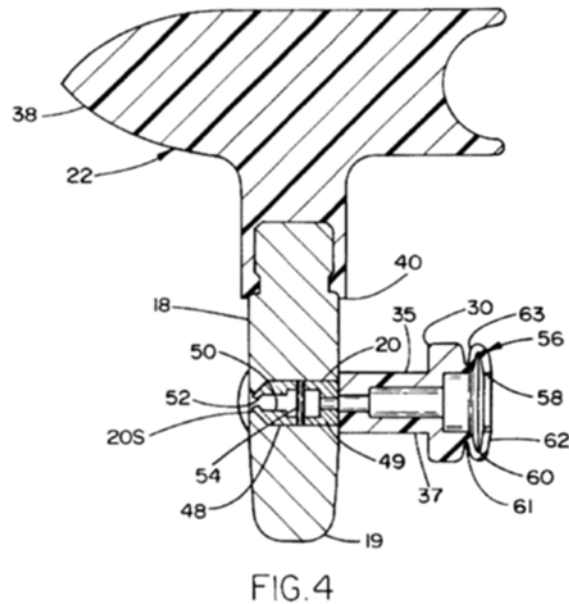
Second, Petitioner proposes to modify Carey and Torntore to include Calder’s “frustoconical” surfaces. *See* Pet. 26. Again, Petitioner cites to the Office Action and reasons that the proposed modification “would allow for easier machining” and a “smoother transition to turbulence and pressure increases.” *See id.* at 26–27 (citing Ex. 1003, 7); *see also id.* at 27 (citing Ex. 1002, 27–28). The only evidence provided by Petitioner in support of this finding, however, is an unsupported statement in the examiner’s rejection and an unsupported statement in Petitioner’s expert declaration. Ex. 1002, 27–28. As noted above, it is not enough to simply cite to the examiner’s reasoning, especially if the examiner’s reasoning itself is without

evidentiary support or explanation. Furthermore, although Dr. Ben-Tzvi testifies that “it would have been obvious to one of ordinary skill in the art at the time of the invention to have conical shaped downstream and upstream sections . . . as taught by Calder since it would allow for easier machining and a smoother transition to turbulence and pressure increases” (Ex. 1002, 27–28), as before, Dr. Ben-Tzvi does not disclose the underlying facts or data on which this opinion is based and is entitled to little or no weight. 37 C.F.R. § 52.65(a); *see also* Fed. R. Evid. 702(b) (“A witness who is qualified as an expert . . . may testify . . . if . . . the testimony is based on sufficient facts or data”). Accordingly, Petitioner’s reasoning lacks rational underpinnings because the record does not support adequately Petitioner’s assertion that Calder’s frustoconical surfaces allow for easier machining or a smoother transition to turbulence.

Moreover, *even if* the modification would have resulted in a “smoother transition to turbulence,” we agree with Dr. Garris and are not persuaded that such a result would be desirable considering that the purpose of the claimed “turbulating chamber” is presumably for promoting turbulent flow. *See* Ex. 2001 ¶ 40 (“I see no evidence or explanation that an alleged ‘smoother transition to turbulence and pressure increases’ would be desirable, or what that statement even means in view of the common understanding that smooth flow is the opposite of turbulence.”). Indeed, the Specification explains that in at least one embodiment, the “turbulating chamber” increases working fluid turbulence, thereby improving the uniformity of a spray pattern and reducing and eliminating undesirable spray “tails.” *See* Ex. 1001, 3:53–60. Accordingly, and for this additional reason,

we are not persuaded that a POSITA would seek to further modify Carey to include Calder's "frustoconical surfaces," as Petitioner proposes.

Third, Petitioner proposes to modify Carey so that its "tip piece" and "pre-orifice piece" abut, as taught by Johnson. See Pet. 27–28. Petitioner reasons that a POSITA would have made the modification to "allow removal of an *interstitial seal* which would allow for a smooth transition between the components as well as an easier assembly feature." See *id.* at 27 (citing Ex. 1003, 8) (emphasis added). Petitioner's reasoning, however, lacks rational underpinnings. Petitioner does not cite to Dr. Ben-Tzvi's testimony (Pet. 27) and upon reviewing Carey and the cited examiner's rejection, we cannot identify the "interstitial seal" that Petitioner intends to remove. We also fail to understand how this proposed modification would make assembly easier. See Ex. 2001 ¶ 42 ("Here again, I note that the Petition fails to provide any evidence or explanation that removing an interstitial seal and abutting a pre-orifice piece to a tip piece would have been desirable to a POSITA"). Furthermore, we are skeptical that a POSITA would position Carey's "tip piece" and "pre-orifice piece" to abut when they appear to be spaced apart to hold pin 54 in its place. To illustrate this structure, we reproduce Carey's Figures 3 and 4, below:



Carey's Figures 3 and 4 depict cross-sectional views of Carey's reversible spray tip. See Ex. 1005, 2:46–54, Fig. 2. As can be seen in both figures, pin 54 is positioned between insert 48 and holder 49, and insert 48 and holder 49 do not abut in order to hold the pin between these pieces and within the bore. See *id.* at 4:28–31 (“A diffuser holder, designated 49, is also press-fitted into bore 20 behind diffuser pin 54 to thereby maintain the pin transversely in bore 20.”). Petitioner fails to explain how the proposed modification of Carey's insert 48 and holder 49 would abut while also holding pin 54 in place. Accordingly, we are not persuaded that a POSITA would have modified Carey so that its “tip piece” and “pre-orifice piece” abut, as required by the claims.

Finally, Petitioner fails to acknowledge the Examiner's statement in the Notice of Allowance that "it would require an unreasonable combination of references that would not suffice for a realistic case of obviousness." *Compare* Pet. 13 (quoting only a portion of the examiner's reasons for allowance), *with* Ex. 1004, 3. The Petition fails to address fully why the Examiner's statement in the notice of allowance was unreasonable or in error.

7. Remaining Independent Claims 16 and 17

Independent claims 16 and 17 contain limitations similar to those discussed above in claim 1, and the Petition relies on the same proposed modifications of Carey with the teachings of Torntore, Calder, and Johnson as presented for claim 1. Pet. 39–54. The Petition is insufficient to establish that it is more likely than not that either of these claims are unpatentable, for substantially the same reasons discussed above.

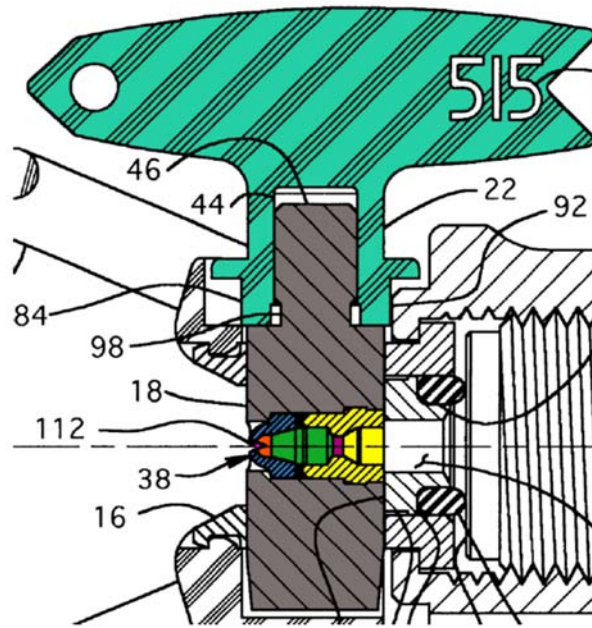
8. Summary

For the reasons discussed above, Petitioner fails to establish a reasonable likelihood that the proposed combination of Carey, Torntore, Calder, and Johnson renders any of claims 1–17 unpatentable.

D. Ground 2: Liska, Torntore, and Johnson

Petitioner asserts that claims 1–17 are unpatentable as obvious over Liska, Torntore, and Johnson. Pet. 62

pre-orifice piece and tip piece.” Pet. 64. Petitioner submits a partially-annotated version of Liska’s Figure 3 to illustrate these features, which we reproduce below:



Petitioner’s reproduction of Liska’s Figure 3 is annotated to show various components in differing colors. According to Petitioner, the above Figure 3 shows Liska’s “tip body” (grey), “tip piece” (blue), “pre-orifice piece” (yellow), “turbulating chamber” (green), and “stepped section” (orange). *Id.* at 63; *see also id.* at 10, n.1. Petitioner acknowledges that a “component” exists between its “tip piece” and “pre-orifice piece,” which presumably prevents its “tip piece” and “pre-orifice piece” from abutting. *See id.* at 65.

To satisfy the claimed “stepped section comprising a plurality of cylindrical steps,” Petitioner relies on Torntore’s teaching of the claimed “plurality of steps.” *See id.*

To satisfy the claimed tip piece “abutting” the pre-orifice piece, Petitioner acknowledges the presence of a “component between the pre-orifice piece and tip piece,” but explains that “this component could be removed and these pieces instead abutted to one another,” as taught by *Leisi*. *See id.* (emphasis added). We assume that Petitioner’s reference to *Leisi* is a clerical error, and Petitioner instead intended to rely on Johnson for teaching the claimed “abutment,” as *Leisi* is not part of the Ground 2 challenge. *See id.* at 62. Johnson, on the other hand, is part of the Ground 2 challenge and, according to Petitioner, allegedly teaches the claimed “abutment,” as discussed above in relation to Ground 1.

Petitioner asserts that there is “ample motivation” to combine *Liska*, *Torntore*, and *Johnson*, because these references “all relate to inventions in reversible paint spray tips.” *See* Pet. 64. Petitioner further explains that “[t]here is nothing in these references to suggest that a combination would not be feasible.” *Id.* Independent claims 16 and 17 contain limitations similar to those discussed above in claim 1, and the Petition relies on the same proposed modifications of *Liska* with the teachings of *Torntore* and *Johnson* as presented for claim 1. Pet. 74–91. The Petition does not cite to the testimony of Dr. Ben-Tzvi in support of this ground.

3. *Our Analysis*

In contesting Petitioner’s Ground 2, Patent Owner argues that Petitioner has failed to present a proper motivation to combine the references. Prelim. Resp. 51. We agree.

Petitioner fails to provide adequate reasoning explaining why a POSITA would have modified *Liska* to include *Torntore*’s “plurality of

steps” or Johnson’s “abutment.” *See* Pet. 64–65. It is not enough to state that “[t]here is ample motivation” because “they all relate to inventions in reversible paint spray tips.” *Id.* at 64. In particular, we are not persuaded that a POSITA would have removed the “component” that exists between Liska’s “tip piece” and “pre-orifice piece” to allow these pieces to “abut,” as Petitioner asserts, without providing any reason to do so. *See id.* at 65. Stated differently, Petitioner’s reasoning focuses on what one of ordinary skill in the art *could* do to modify Liska in a manner that meets the claims, without adequately explaining *why* one of ordinary skill in the art *would* make the modifications. *See PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993–94 (Fed. Cir. 2017) (finding that a skilled artisan would have understood that prior art could be combined insufficient; “it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention”).

4. Summary

For the reasons discussed above, Petitioner fails to establish a reasonable likelihood that the proposed combination of Liska, Torntore, and Johnson renders any of claims 1–17 unpatentable.

E. Ground 3: Johnson and UMN

Petitioner asserts that claims 1–5, 9–12, 16, and 17 are unpatentable over Johnson and UMN. Pet. 100.

1. UMN (Exs. 1010, 1018, 1019)

UMN is a compilation of three exhibits (Ex. 1010, 1018, 1019), and Petitioner relies on them to establish a public use under 35 U.S.C.

§ 102(a)(1). *See id.* at 101. In particular, UMN is evidence of a University of Minnesota design show at which student teams submitted design projects for public viewing to be judged by professional engineers. *See id.* at 101–102.

Petitioner asserts that “UMN publicly disclosed *at least roughly 65 different airless spray tips*, as well as information on the design process.” *Id.* at 103 (citing Exs. 1010, 1018, 1019) (footnote omitted, emphasis added). Exhibit 1018 of UMN includes photos from the design show and sets forth the students’ “Problem Statement,” a picture of various nozzle prototypes, and the “Final Design.” *See* Ex. 1018, 3, 5.

UMN’s “Problem Statement” (*id.* at 5) reads:

This project aims to develop a one piece spray tip that will allow the use of lower spray pressures in airless paint sprayers.

- Low spray pressures produce thick edges on spray pattern (tails)
- Absence of a reliable method of prototype verification.

We reproduce what appears to be a photo of various nozzle prototypes (*id.* at 3):



The photo shows cross-sectional cutouts of several different nozzles laid out on a flat surface.

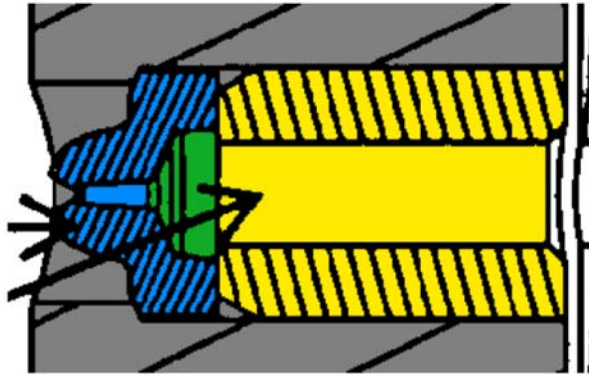
We also reproduce UMN's "Final Design" (*id.* at 5), below



As can be seen above, the “Final Design” includes “recirculation pockets,” which appear in the provided drawing as two triangular-shaped indentations on either side of the outlet orifice.

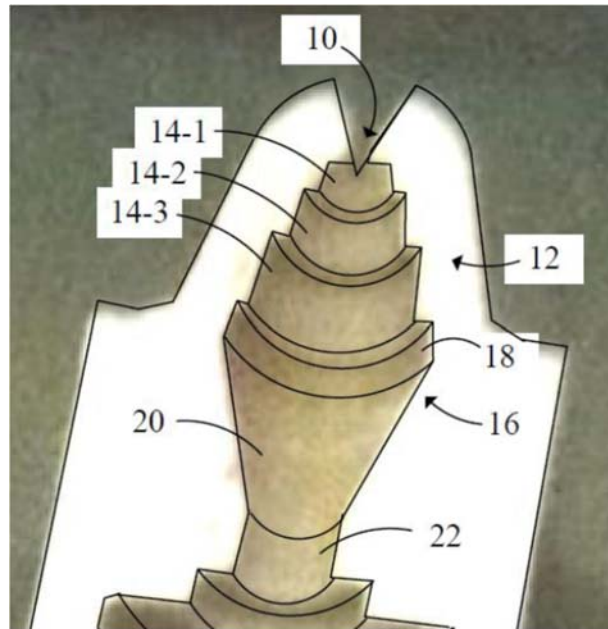
2. *Petitioner’s Challenge*

Petitioner relies on Johnson for disclosing the claimed “tip piece,” “pre-orifice piece,” and “turbulating chamber.” See Pet. 107 (referencing Ex. 1008, Fig. 2). Petitioner submits a partially-annotated view of Johnson’s Figure 2 (Pet. 107), which we reproduce, below:



Petitioner’s reproduction of Johnson’s Figure 2 is annotated to show various components in differing colors. According to Petitioner, Johnson discloses a “tip piece” (blue), “pre-orifice piece” (yellow), and “turbulating chamber” (green), in which its tip piece and pre-orifice piece abut. See *id.* (citing Ex. 1016, 2:55).

To address the claimed “frustoconical surfaces” and “plurality of steps,” Petitioner relies on UMN. See Pet. 106. Petitioner asserts that “UMN discloses the internal geometry of the turbulating chamber as recited in independent claim 1” (*id.* at 106) and cites to Figure 1 of Exhibit 1010, which we reproduce, below:



According to Petitioner, the above figure shows UMN’s “plurality of steps” and “frustoconical surfaces.” *See id.*; *see also id.* at 114–115 (claim chart associating the claimed “plurality of steps” with UMN), 117–119 (claim chart associating the claimed “frustoconical surface” with UMN).

Petitioner proposes to modify Johnson to include “the internal geometries of UMN to reach the claims . . . because doing so would solve the problem laid out in UMN, namely ‘low spray pressures produce thick edges on spray patterns (tails).’” Pet. 105 (citing Ex. 1018).

Independent claims 16 and 17 contain limitations similar to those discussed above in claim 1, and the Petition relies on the same proposed modifications of Johnson with UMN as presented for claim 1. Pet. 120–140. The Petition does not cite to the testimony of Dr. Ben-Tzvi in support of this ground.

3. *Our Analysis*

In contesting Ground 3, Patent Owner argues that “Petitioner again fails to show motivation to combine the references.” Prelim. Resp. 60. We agree.

Petitioner reasons that a POSITA would have modified Johnson to include UMN’s “frustoconical surfaces” and “plurality of steps” in order to solve a problem caused at low spray pressures, namely, the undesirable production of thick edges (or tails) on spray patterns. See Pet. 105 (citing Ex. 1018). Petitioner’s reasoning, however, lacks adequate support.

We are not persuaded that UMN teaches either the claimed “frustoconical surfaces” or “plurality of steps” for the purpose of solving any problem, let alone the problem of “tailing” caused during low spray pressures. Petitioner fails to cite to any declaration or evidence, and we find nothing in Exhibits 1010, 1018, and 1019 that leads us to believe that it is the internal geometry of the particular prototype (shown on page 1 of Exhibit 1010) that solves the problem identified on page 5 of Exhibit 1018.

Petitioner selectively picks and chooses one particular prototype in UMN (that includes the “plurality of steps” and “frustoconical surfaces”), while failing to address the other prototypes, in an apparent effort to meet the claims. See Pet. 104 (citing Ex. 1010, Fig. 1). As even acknowledged by Petitioner, however, “UMN publicly disclosed . . . roughly *65 different airless spray tips*” (*see id.* at 103 (emphasis added)), many of which do not appear to include “frustoconical surfaces” or “pluralities of steps” (*see, e.g.,* Ex. 1018, 3 (depicting several different spray tip structures)). However,

[i]t is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will

support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art.

In re Wesslau, 353 F.2d 238, 241 (CCPA 1965).

Moreover, if anything, we find that a POSITA would have more likely associated the “recirculation pockets” of the students’ “Final Design” to address the problem of “tailing” caused during low spray pressures. See Ex. 1018, 5. We reproduce the students’ “Final Design” (*id.*), below:



As can be seen above, the Final Design appears to lack the claimed “plurality of steps” or “frustoconical surfaces,” but includes “recirculation pockets.” In its “Discussion,” Exhibit 1018 states that the “Recirculation design [is] capable of withstanding 4,000 psi static pressure (4 times its suggested operating pressure)” and that “Recirculation pockets keep outside fluid off walls.” Ex. 1018, 4. Indeed, the students’ project appears to have culminated in an improved design that incorporates these recirculation pockets, rather than the “plurality of steps” or “frustoconical surfaces” that Petitioner would have us believe. Absent any discussion or evidence from Petitioner, we are more inclined to believe that a POSITA would have found UMN to teach the incorporation of recirculation pockets, rather than the

“plurality of steps” or “frustoconical surfaces,” in solving the tailing problem.

4. Summary

For the reasons discussed above, Petitioner fails to establish that the proposed combination of UMN and Johnson more likely than not renders any of claims 1–5, 9–12, 16, or 17 unpatentable.

F. Ground 4: Johnson, UMN, and Leisi

Petitioner relies on Leisi to satisfy several of the claimed features of dependent claims 6–8, 14, and 15, but otherwise relies on Johnson and UMN (Ground 3) for addressing the limitations of independent claim 1, from which claims 6–8, 14, and 15 depend. *See* Pet. 145–149.

For the same reasons that Petitioner fails to establish that the proposed combination of UMN and Johnson more likely than not renders independent claim 1 unpatentable, Petitioner also fails to establish that the proposed combination of UMN, Johnson, and Leisi more likely than not renders dependent claims 6–8, 14, and 15 unpatentable.

G. Ground 5: Johnson, UMN, and TeeJet

Petitioner relies on TeeJet to satisfy several of the claimed features of dependent claim 13, but otherwise relies on Johnson and UMN (Ground 3) for addressing the limitations of independent claim 1, from which claim 13 indirectly depends. *See* Pet. 150–152.

For the same reasons that Petitioner fails to establish that the proposed combination of UMN and Johnson more likely than not renders independent

claim 1 unpatentable, Petitioner also fails to establish that the proposed combination of UMN, Johnson, and TeeJet more likely than not renders dependent claim 13 unpatentable.

III. CONCLUSION

Upon review of Petitioner's analysis and supporting evidence, Petitioner has not shown that any of the challenged claims of the '982 patent is more likely than not unpatentable. Accordingly, we decline to institute post-grant review of the '982 patent.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 324(a), the petition for post-grant review is *denied*.

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PETITIONER:

Christopher Christenson
KELLY, HOLT & CHRISTENSON PLLC
cchristenson@khcip.com

Brad D. Pedersen
PATTERSON THUENTE PEDERSEN, P.A.
pedersen@ptslaw.com

PATENT OWNER:

Michael T. Hawkins
Stuart A. Nelson
Craig A. Deutsch
FISH & RICHARDSON P.C.
hawkins@fr.com
snelson@fr.com
deutsch@fr.com