

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CARLISLE CONSTRUCTION MATERIALS, LLC,
Petitioner,

v.

GRACO MINNESOTA INC.,
Patent Owner.

IPR2022-00635
Patent US 7,527,172 B2

Before MICHAEL L. WOODS, SEAN P. O'HANLON, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

DOUGAL, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background and Summary

Petitioner, Carlisle Construction Materials, LLC, requests that we institute an *inter partes* review to challenge the patentability of claims 1–5, 10–12, 14, and 15 (the “challenged claims”)¹ of patent US 7,527,172 B2 (Ex. 1001, “the ’172 patent”). Paper 2 (“Petition” or “Pet.”). Patent Owner, Graco Minnesota Inc., argues that Petitioner’s request is deficient and should not be granted. Paper 6 (“Preliminary Response” or “Prelim. Resp.”).

Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we deny the Petition and decline to institute an *inter partes* review.

B. Related Matters

The parties identify the following related district court litigation: *Graco Inc., et al. v. Carlisle Construction Materials, LLC*, No. 1:21-cv-00245-CFC (D. Del.). Pet. 2; Paper 4, 2.

C. The ’172 Patent

The ’172 patent is entitled “Plural Component Mixing and Dispensing Apparatus” and is related to “an air-operable gun for mixing and dispensing thermoplastic and thermosetting plural component materials, such as . . . compositions that react rapidly upon mixing of the components thereof.” Ex. 1001, code (54), 1:6–12. Figure 1, reproduced below, shows an exemplary plural component handgun.

¹ Claims 7 and 9 were also challenged, but have since been disclaimed by Patent Owner. Ex. 2004.

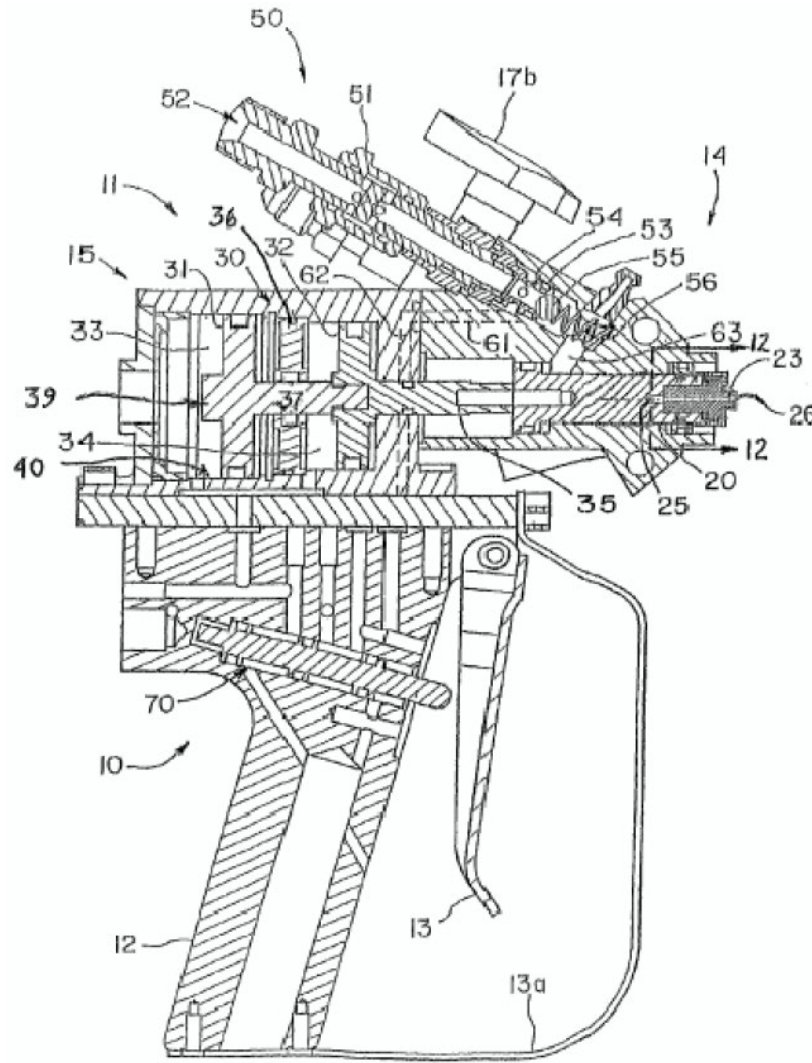


FIG. 1

The plural component handgun (10) shown in Figure 1 includes a handle (12) with a trigger (13), an air inlet means (50), an air actuator (30), a connection portion (14) for connecting the plural components, and a mixing and dispensing element (20). *Id.* at 4:17–25, 4:30–34, 4:51–54, 4:65–5:3. The mixing and dispensing element (20) moves or slides between forward and rearward positions with the actuation of the trigger to mix and dispense the plural components in a controlled fashion. *Id.* at 4:65–5:3, 6:32–54.

The '172 patent discusses improvements to the plural component handgun, in particular with relation to the mixing and dispensing element (20) illustrated below in Figure 3, and in cross-section in Figure 4.

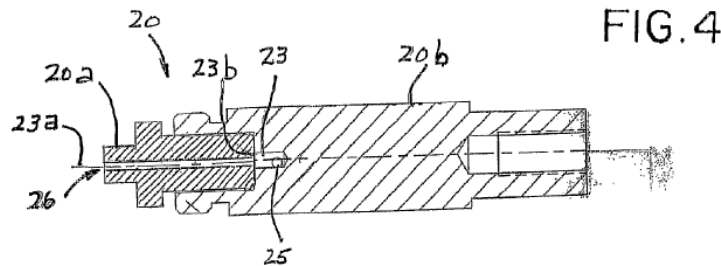
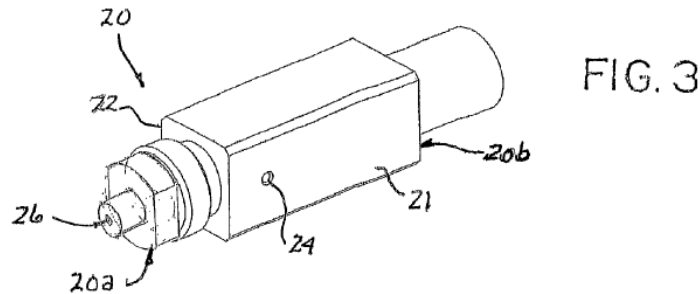


Figure 3, above top, shows the mixing and dispensing element in perspective having planar sides (21, 22) with a dispensing orifice (26), and shows one of the two admission passages (24, 25). *Id.* at 3:51–53, 5:5–12. As can be seen more clearly in the cross-section of Figure 4, above bottom, the mixing and dispensing element is a two-part assembly having a forward element (20a) separate from, but inserted into, a rearward element (20b). *Id.* at 5:56–58. It can also be seen that a mixing chamber (23) extends from the admission passages (24, 25) in the rearward element (20b) through the forward element (20a) to the dispensing orifice (26). *Id.* at 5:61–6:2. The two-part assembly allows the mixing chamber to more easily include different diameter sections so that a discontinuity (23b) “creates turbulence that assists mixing the plural components together without adversely affecting the desired uniformity of the spray pattern formed as the mixed plural component material is dispensed from the dispensing orifice 26.” *Id.* at 6:6–13.

The '172 patent also teaches that “[i]n the preferred mixing and dispensing element 20, the diameters of admission passages 24 and 25 are preferably equal, and the cross-sectional area of the dispensing orifice 26 is preferably equal to the sum of the cross-sectional areas of the admission passages 24 and 25.” *Id.* at 5:44–49.

D. Illustrative Claim(s)

Petitioner challenges claims 1–5, 10–12, 14, and 15 of the '172 patent. Claims 1 and 10 are independent and claim 1 is illustrative:

1. In an apparatus for mixing the plural components of a plural component material and dispensing the mixed plural component material, including

a housing including a connection portion at its forward end and an actuator portion at its rearward end;

a mixing and dispensing element formed with opposed planar side portions, an unobstructed air purge-able cylindrical mixing chamber within the element between the planar side portions, a pair of cylindrical admission passages, with one cylindrical admission passage extending between each of the planar side portions and the mixing chamber, and a dispensing orifice in communication with the mixing chamber at the forward end of the mixing and dispensing element, said mixing and dispensing element being slidably carried by the connection portion of the housing;

a connection block for each of the plural components carried by the connection portion of the housing, one connection block being carried on each side of the connection portion of the housing with a side surface interfacing with a planar side portion of the mixing and dispensing element, each connection block providing means for connecting a supply of one of the plural components with the mixing chamber of the mixing and dispensing element and including an internal supply passageway leading to an outlet opening in its side surface, the side surface of each of said connection blocks carrying a seal element around its outlet opening that slidably engages the interfacing planar side

portion of the mixing and dispensing element and seals the interface between the connection block and the mixing and dispensing element; and

an air-operated actuator carried by the actuator portion of the housing for sliding the mixing and dispensing element with respect to the connection portion of the housing between a rearward position at which the admission openings of the mixing and dispensing element communicate with the outlet openings of the connection blocks, permitting a flow of the plural components into the mixing chamber for mixing and dispensation, and a forward position at which the outlet openings of the connection blocks are blocked by the planar side portions of the mixing and dispensing element and the admission openings are located to provide a purging flow of air through the mixing chamber and dispensing orifice;

the improvement wherein said mixing and dispensing element comprises two parts with said dispensing orifice being formed in a forward part and said cylindrical admission passages being formed in a rearward part and with the unobstructed air purge-able cylindrical mixing chamber extending forwardly from the admission passages through the two parts to the dispensing orifice, each of the admission passages having a cylindrical sidewall with a lesser diameter than the cylindrical sidewall of the mixing chamber, and each of the cylindrical sidewalls of the admission passages crossing and being tangent to the cylindrical sidewall of the mixing chamber at its intersection with the cylindrical sidewall of the mixing chamber, the sum of the cross-sectional areas of the cylindrical admission passages being substantially equal to the cross-sectional area of the dispensing orifice.

Ex. 1001, 9:40–10:34.

E. Asserted Grounds

Petitioner asserts the following grounds of unpatentability (Pet. 8–9), supported by the declaration of David A. Rockstraw, Ph.D., P.E. (Ex. 1003):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–5, 10–12, 14, 15	103(a) ²	Probst, ³ Probler ⁴
1–5, 10–12, 14	103(a)	Zittel, ⁵ Fusion, ⁶ Hagfors ⁷

II. ANALYSIS

A. Legal Standards

Petitioner bears the burden to demonstrate unpatentability. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). At this preliminary stage, we determine whether the information presented in the Petition shows a reasonable likelihood that Petitioner would prevail in establishing that at least one of the challenged claims would have been obvious over the proposed combinations of prior art. *See* 35 U.S.C. § 314(a).

A claim is unpatentable as obvious under 35 U.S.C. § 103(a) if “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 Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). We resolve the question of obviousness based on underlying factual determinations, including: (1) the

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 285–88 (2011), revised 35 U.S.C. § 103 effective March 16, 2013. We refer to the pre-AIA version of § 103.

³ US 3,799,403, issued Mar. 26, 1974 (Ex. 1005, “Probst”).

⁴ Glas-Craft Probler Dispense Gun User Manual, Nov. 1999 (Ex. 1007, “Probler”).

⁵ WO 2004/037429 A2, pub. May 6, 2004 (Ex. 1006, “Zittel”).

⁶ Graco Fusion Protective Coatings Brochure, 2003 (Ex. 1015, “Fusion”).

⁷ US 3,437,273, issued Apr. 8, 1969 (Ex. 1016, “Hagfors”).

scope and content of the prior art; (2) any differences between the prior art and the claims; (3) the level of skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We apply these principles to the Petition’s challenges.

B. Level of Ordinary Skill in the Art

Petitioner asserts that a person of ordinary skill in the art

would have had at least a bachelor’s degree in chemical engineering, materials engineering, mechanical engineering or equivalent technical degree, with knowledge regarding fluid dynamics, and three years of experience in the research, design, or implementation of systems for mixing and dispensing multiple components. Ex.1003(¶85-86). Additional education might supplement practical experience and vice-versa, i.e., someone with significant industry experience may have developed the engineering skills that would have been taught in a formal degree. Ex.1003(¶85-86).

Pet. 30–31.

Patent Owner argues that a person of ordinary skill in the art

would have at least a bachelor’s degree in mechanical engineering or other related engineering/scientific fields, with at least three years of relevant practical experience in developing fluid component delivery devices. EX2001, ¶¶15-16. Also, an increase in experience could compensate for less education, and an increase in education could likewise compensate for less experience. *Id.*

Prelim. Resp. 6–7.

At this stage, the differences between Petitioner’s and Patent Owner’s positions do not affect or influence our Decision. We adopt Petitioner’s definition of the level of skill for the purposes of this Decision.

C. Claim Construction

In an *inter partes* review, we construe claims using the same claim construction standard that would be used to construe the claim 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) (2021).

Patent Owner argues that “[c]laims 1 and 10 both expressly recite that the claimed mixing and dispensing element must have ‘two parts’/‘a two-part assembly,’ not merely a one-piece element having front and rear ends.” Prelim. Resp. 7. The Petition does not expressly address the claim construction of these terms (*see, e.g.*, Pet. 9–10, 41–42, 55), but as will be discussed in later sections, Petitioner asserts that Probst and Zittel each discloses such a mixing and dispensing element (*id.* at 41–42, 55, 70–71, 85).

To determine how these terms should be construed, we first look to how the terms are used in the claims. The relevant portion of claim 1 states:

said mixing and dispensing element comprises two parts with said dispensing orifice being formed in a forward part and said cylindrical admission passages being formed in a rearward part and with the unobstructed air purge-able cylindrical mixing chamber extending forwardly from the admission passages through the two parts to the dispensing orifice.

Ex. 1001, 10:18–24. The relevant portion of claim 10 states:

a two-part assembly having a forward part and a rearward part and forming an unobstructed cylindrical internal mixing chamber to provide mixing and spraying of the mixed plural components.

Id. at 11:57–60. Both claims refer to two parts and use the terms “forward part” and “rearward part.” Further, though not quoted above, claim 10

elsewhere includes similar structure for the forward and rearward parts as listed above in claim 1. On its face, the “two-part assembly” of claim 10 requires more than a one-piece element having front and rear ends. In particular, a one-piece element does not satisfy the requirement of an assembly. Claim 1 is not as clear on that point, though as noted it does include similar structure and similar language as claim 10, including the two parts forming the forward part and rearward part.

We now turn to the Specification and file history to further determine how “two parts” would be understood by one of skill in the art. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1321 (Fed. Cir. 2005) (“The risk of systematic overbreadth is greatly reduced if the court instead focuses at the outset on how the patentee used the claim term in the claims, specification, and prosecution history, rather than starting with a broad definition and whittling it down.”).

The figures of the ’172 patent show a single embodiment where, as seen in Figure 4, previously reproduced herein, the mixing and dispensing element (20) is a two-part assembly having a forward element (20a) separate from, but inserted into, a rearward element (20b). Ex. 1001, 5:56–58, Fig. 4. From our review of the Specification, a single piece mixing and dispensing element is not described; however, it also is not expressly excluded.

Further, the ’172 patent describes that some of the new and improved aspects of the design relate to there being a mixing and dispensing element formed by a two-part construction. *Id.* at 5:56–6:21; Prelim. Resp. 9–10; Ex. 2001 ¶ 26. For example, the “two-part construction” allows for a mixing chamber having a two different diameters and “a discontinuity 23b in the mixing chamber 23 (see FIG. 4), which creates turbulence that assists mixing the plural components together without adversely affecting the

desired uniformity of the spray pattern.” Ex. 1001, 6:6–13; *see also id.* at 2:52–3:36 (discussing the invention’s asserted advances over the prior art).

The ’172 patent also describes the “two-part construction” as providing additional benefits:

The manufacturing of the mixing and dispensing element 20 is made substantially more reliable and consistent with its preferred two-part construction because the portion of the mixing chamber 23 in the rearward part 20b of the mixing and dispensing element is substantially shorter, further avoiding the departure of the central axis 23a of the mixing chamber 23 from concentricity with its intended position and permitting tangency of the sidewalls of the mixing chamber 23 and admission passage 24, 25.

Id. at 6:13–21; *see also* Prelim. Resp. 9–10; Ex. 2001 ¶ 26.

Turning now to the prosecution history, Patent Owner correctly notes that this issue was expressly addressed during examination of the application that became the ’172 patent. Prelim. Resp. 10 (citing e.g., Ex. 1002, 61–62, 70). In response to a rejection over *Sinders*,⁸ the Applicant argued that claim 1 was allowable because *Sinders* does not disclose or suggest:

wherein said mixing and dispensing element comprises two parts, with the dispensing orifice being formed in a forward part and said admission passages being formed in a rearward part and with the mixing chamber extending forwardly from the admission passages through the two parts to the dispensing orifice.

Ex. 1002, 62 (which is the original, pre-amendment language of claim 1).⁹

⁸ US 6,796,461 B1, issued Sept. 28, 2004 (Ex. 2005, “*Sinders*”).

⁹ The Applicant also argued the patentability of other claims which included the term “portions” instead of parts, but also included features related to the diameter of the mixing chamber not present in claim 1 and therefore not relevant to our discussion. *See* Ex. 1002, 62.

The Examiner then determined, and maintained throughout examination, that Sindera “does not disclose the improvement[] of a two part mixing and dispensing element.” *Id.* at 70; *see also id.* at 71, 108–11, 171 (“Sindera . . . does not disclose . . . a two-part outlet.”); *see also* Prelim. Resp. 6, 10.¹⁰ We note that Patent Owner correctly describes Sindera as disclosing a one-piece mixing and dispensing element. Prelim. Resp. 6; *see* Ex. 2005, Figs. 1, 3 ref. no. 20.

The Examiner then cited a number of other references as “having a two part mixing and dispensing element” or “dual component dispensers.” Ex. 1002, 70, 71, 72; *see also id.* at 107, 108–109, 110, 111, 171–172. Our review of these citations by the Examiner reveals that each cited mixing and dispensing element is made up of at least two separate pieces. *See, e.g.*, US 6,811,096, issued Nov. 2, 2004 (Ref. Nos. 104, 106 of “Frazier” cited at Ex. 1002, 70); US 4,760,956, issued Aug. 2, 1988 (Ref. Nos. 205, 207 of “Mansfield” cited at Ex. 1002, 71); and US 1,261,712, issued Apr. 2, 1918 (Ref. Nos. 1, 4 of “Crispell” cited at Ex. 1002, 107).

Based on our review of the claim language, the Specification, and the prosecution file history, we determine that one of ordinary skill in the art would understand that the claimed mixing and dispensing element of claims

¹⁰ Patent Owner also correctly notes that “[t]he Petition never demonstrated a ‘material error by the Office’ in this repeated conclusion that conventional one-piece mixing chambers were distinct from the claimed structure. *Advanced Bionics, LLC v. Med-El Elektromedizinische Gerate GMBH*, IPR2019-01469, Paper No. 6 at 10-11, 20-21 (PTAB Feb. 13, 2020) (Precedential) (burdening petitioner to show there was ‘a material error by the Office’ where substantially similar prior art was considered during prosecution).” Prelim. Resp. 6.

1 and 10 requires “two parts” or “a two-part assembly” where the two parts are two separate pieces, consistent with the position of Patent Owner.

It is not necessary for us to construe any other terms for the purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms that are in controversy, and only to the extent necessary to resolve the controversy.” (internal quotation omitted)).

D. 35 U.S.C. 103(a) – Probst, Probler

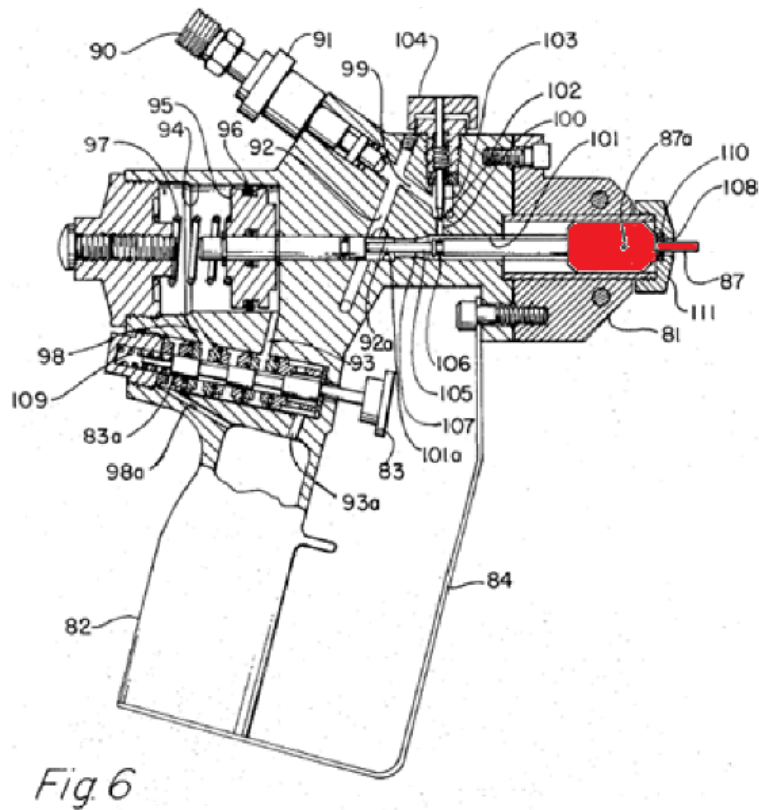
Petitioner argues that the combination of Probst and Probler renders obvious claims 1–5, 10–12, 14, and 15. Pet. 31–58. Patent Owner disagrees. Prelim. Resp. 14–42.

For the reasons expressed below, we determine that Petitioner has not established a reasonable likelihood that at least one claim is unpatentable.

1. Probst

Probst discloses a plural component dispensing device where “the mixing chamber . . . is movable with respect to the housing . . . so that a gas can be used to purge the mixing chamber of the residue of plural component material upon termination of the dispensing operation.” Ex. 1005, Abstr.

A version of Probst Figure 6, edited by Petitioner, is reproduced below. Pet. 33.



A cross-section of a plural component dispensing device from Probst Figure 6 is shown above, with red highlighting added by Petitioner to identify the means forming the mixing chamber (87). Probst teaches that the “Means forming the mixing chamber 87 includes two flat and smooth surfaces that include apertures 87a intersecting a bore (unshown) that forms the mixing chamber in the manner shown in FIGS. 3 through 5.” Ex. 1005, 9:38–43. Probst Figure 3 shows another embodiment of plural component dispensing device, which is reproduced below with highlighting added by Patent Owner. Prelim. Resp. 16.

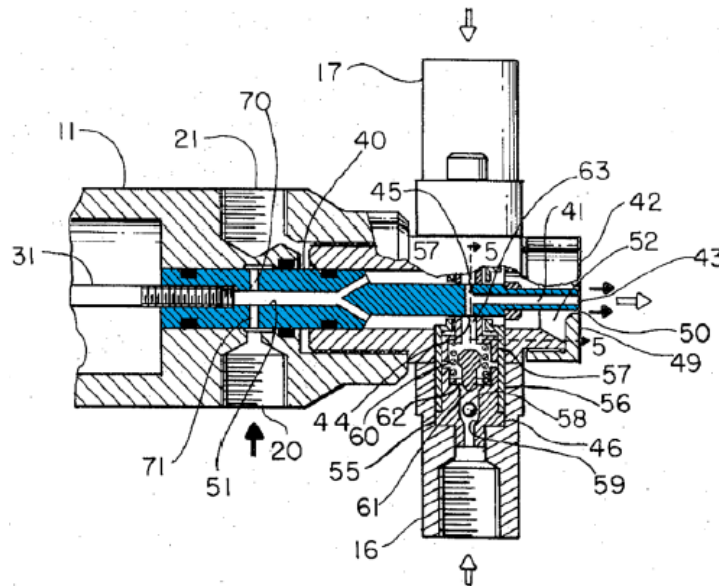


Fig. 3

A cross-section detail view of a plural component dispensing device from Probst Figure 3 is shown above, with blue highlighting added by Patent Owner to identify the elongated means (40) which corresponds to the means forming the mixing chamber (87) of the embodiment of Figure 6. As can be seen, the elongated means (40) is formed from a single piece of material.

2. *Probler*

Probler is a user manual and states that “[t]he Probler Gun is used to spray, pour or form two-component, low viscosity polyurethane foam materials at outputs up to 60 pounds per minute. The Gun features an air-assisted full-finger trigger and a patented solvent-free automatic air-purge cleaning system.” Ex. 1007, 1, 13. Probler teaches that different sized mixing chambers can be used with the gun. *Id.* at 15, 18–19.

3. *Claims 1 and 10*

As will be discussed below, the Petition fails to show how the prior art teaches all of the limitations of the claims. As such, it is unnecessary to

address all claim limitations. Rather, we focus our discussion on two claim elements, which are in both of the independent claims.

a) Two Parts

Relevant to our discussion, claim 1 includes:

said mixing and dispensing element comprises two parts with said dispensing orifice being formed in a forward part and said cylindrical admission passages being formed in a rearward part and with the unobstructed air purge-able cylindrical mixing chamber extending forwardly from the admission passages through the two parts to the dispensing orifice.

Ex. 1001, 10:18–24. The relevant portion of claim 10 states:

a two-part assembly having a forward part and a rearward part and forming an unobstructed cylindrical internal mixing chamber to provide mixing and spraying of the mixed plural components.

Id. at 11:57–60.

As discussed above, we determine that one of ordinary skill in the art would understand that the claimed mixing and dispensing element of claims 1 and 10 requires “two parts” or “a two-part assembly,” where the two parts are two separate pieces. *See supra* § II.C.

The Petition asserts that the means forming the mixing chamber (87) of Probst teaches this limitation. Pet. 41–42, 55. The Petition asserts that Probst “discloses a two-part mixing and dispensing element,” and adds highlighting to Probst Figure 6 to identify the “forward part” and the “rearward part.” *Id.* at 41–42. The Petition does not make clear how the limitation of “two parts” in claim 1 or a “two-part assembly” in claim 10 is met by Probst other than to add two different colors to the means forming the mixing chamber (87) in Probst Figure 6.

As noted in our discussion of Probst, Probst teaches that the means forming the mixing chamber (87) “forms the mixing chamber in the manner

shown in FIGS. 3 through 5,” which teaches a corresponding elongated means (40) which is formed from a single piece of material. Ex. 1005, 9:38–43, Figs. 3–5. Probst does not include any disclosure or suggestion that either the means forming the mixing chamber (87) or the corresponding elongated means (40) is formed from two or more pieces of material. The Petition contains no explanation for how Probst would teach the means forming the mixing chamber (87) being formed from two or more pieces of material. *See* Pet. 41–42, 55. Thus, the Petition fails to show how Probst teaches or suggests this limitation.

We note that the Petition provides citations to Petitioner’s declarant and that Petitioner’s declarant provides more detailed discussions and reasoning as to how Probst teaches this limitation under different theories. *See* Pet. 41–42 (citing Ex. 1003 ¶¶ 118–121). For example, Petitioner’s declarant puts forth an argument that because Probst states in the summary of the invention that the mixing chamber has a “cooperatively associated orifice,” this means that the means forming the mixing chamber (87) in the specific embodiment of Figures 5 and 5 is two separate pieces. Ex. 1003 ¶ 120; *see* Ex. 1005, 2:50–52. Not only is Petitioner’s declarant’s statement conclusory, but it also does not address Probst as a whole including the specific disclosures discussed above where Probst teaches a one piece means forming the mixing chamber. Thus, we are not convinced by Petitioner’s declarant.

We further determine that the Petition improperly incorporates by reference these arguments by Petitioner’s declarant. *See* 37 C.F.R. § 42.6(a)(3). As the Board has previously determined, it is improper when “the Petition includes citations to the Declaration to support conclusory statements for which the Petition does not otherwise provide an argument or

explanation.” *Cisco Sys., Inc. v. C-Cation Techs., LLC*, No. IPR2014-00454, Paper 12 at 10 (Aug. 29, 2014). Thus, we do not consider these arguments by Petitioner’s declarant as arguments made in the Petition.

For all of the above reasons, the Petition fails to identify how the combination of Probst and Probler teaches or suggests the noted limitations of claims 1 and 10.

b) Substantially Equal Cross-Sectional Areas

Relevant to our discussion, claims 1 and 10 include:

the sum of the cross-sectional areas of the cylindrical admission passages being substantially equal to the cross-sectional area of the dispensing orifice / spraying orifice.

Ex. 1001, 10:31–34, 12:29–31.

The Petition relies on the combination of Probst and Probler for teaching this limitation, however, it primarily relies on the teachings of Probler. Pet. 42–46, 56. The Petition asserts that Probler teaches its “mixing chamber and orifice diameter” and its “admission passage diameter” (*id.* at 43), and thus, the respective cross-sectional areas can be determined which “are substantially equal, including because 5 of them are within ten thousandths to millionth in.² of each other” (*id.* at 46).

Petitioner’s analysis presumes that Probler’s “mixing chamber nozzle cleaning drill” shares the same diameter as its “mixing chamber and orifice,” while also presuming that the diameter of the “side hole cleaning drill” is equal to the “admission passage” diameter. *See id.* at 43. However, Patent Owner correctly notes that there is no evidence that the recommended size of a drill bit to clean out the identified openings is the same size as the openings. Prelim Resp. 21–28. Rather, Petitioner and Petitioner’s declarant merely state that they are the same. Pet. 43; Ex. 1003 ¶ 130 (“The cleaning

drill size is a drill bit diameter that matches the size of the orifice. . . .[T]hese cleanout drill sizes teach the preferred sizes of admission passages and mixing chambers/spray nozzles. . . .”).

Patent Owner argues that, as supported by their declarant’s testimony, “diameters of a ‘cleaning drill’ bit was always smaller than bore diameter of the actual admission passage/mixing chamber.” Prelim. Resp. 21 (citing Ex. 2001 ¶¶ 39–47). Patent Owner argues persuasively that the drill bit must be smaller in order to rotate within the hole and not damage the surface. *Id.* at 24 (citing Ex. 2001 ¶ 42). Patent Owner’s argument is further supported by Probler itself, which teaches “the cleaning drill bit must be smaller than the mixing chamber’s diameter because a user must ‘tak[e] care not to scratch the Mixing Chamber’s polished surfaces.’” *Id.* at 21–22 (quoting Ex. 1007, 16).

Patent Owner also argues persuasively that the diameter of the admission passages and orifice would be “engineered . . . to custom bore diameters for achieving desired fluid flow and spray characteristics, while the ‘cleaning drill’ size was determined by selecting a smaller ‘standard’ drill bit.” *Id.* at 25 (citing Ex. 2001 ¶ 44).

As the Petition has *not* identified that Probler teaches its “mixing chamber and orifice diameter” and its “admission passage diameter” (Pet. 43), the respective cross-sectional areas *cannot* be determined. Thus, the Petition fails to show that the combination of Probst and Probler teaches or suggests the substantially equal cross-sectional areas required by the claims.

For all of the above reasons, the Petition fails to identify how the combination of Probst and Probler teaches or suggests the noted limitations of claims 1 and 10.

For the reasons expressed above, we determine that Petitioner has not established a reasonable likelihood that at least one claim is unpatentable.

4. *Claims 2–5, 11, 12, 14, 15*

Claims 2–5, 11, 12, 14, and 15 each depends from either claim 1 or 10. Thus, for at least the above reasons, the Petition also fails to identify how the combination of Probst and Probler teaches or suggests all of the limitations of these dependent claims.

E. *35 U.S.C. 103(a) – Zittel, Fusion, Hagfors*

Petitioner argues that the combination of Zittel, Fusion, and Hagfors renders obvious claims 1–5, 10–12, and 14. Pet. 58–88. Patent Owner disagrees. Prelim. Resp. 42–66.

For the reasons expressed below, we determine that Petitioner has not established a reasonable likelihood that at least one claim is unpatentable.

1. *Zittel*

Zittel is directed to a plural component spray gun “designed so as to be easily serviceable with a minimum of tools.” Ex.1036, Abstr. Zittel provides little detail about the overall spray gun, but describes the mixing chamber as having two impingement holes and as being “made of a hardened metal material such 440C stainless steel.” *Id.* at 4, 7.

2. *Fusion*

Fusion is a brochure that discloses plural component spray guns. Ex.1015, 1. Fusion discloses “hardened stainless steel mix chambers” that have been designed to “optimize[] material mix and reduce[] overspray.” *Id.* at 3. Fusion notes that different sized mix chambers can be used, as well as different tips. *Id.* at 4–5.

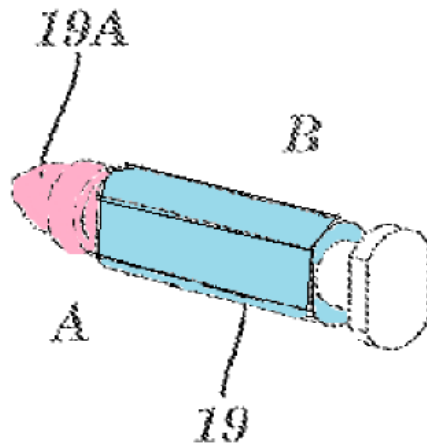
3. *Claims 1 and 10*

As will be discussed below, the Petition fails to show how the prior art teaches all of the limitations of the claims. As such, it is unnecessary to address all claim limitations. Rather, we focus our discussion on the same two claim elements discussed above with respect to the prior ground and which are in both of the independent claims.

a) *Two Parts*

As discussed above, we determine that one of skill in the art would understand that the claimed mixing and dispensing element of claims 1 and 10 requires “two parts” or “a two-part assembly” where the two parts are two separate pieces. *See supra* § II.C.

The Petition asserts that the mixing chamber (19) of Zittel teaches this limitation. Pet. 70–71. The Petition relies on a marked-up excerpt from Zittel Figure 5, reproduced below, to support Petitioner’s position. *Id.* at 71.



Petitioner explains that “Figure 5, excerpted and annotated [above], shows the forward part (‘tip’) in pink and the rearward part in blue, where the mix chamber internally extends from the rearward part to the forward part.”¹¹ *Id.*

¹¹ We also note that Petitioner’s argument does not address the full claim language which requires that the mixing chamber extend through both parts.

Similar to the prior ground, the Petition does not make clear how the limitation of “two parts” in claim 1 or a “two-part assembly” in claim 10 is met by Zittel other than to add two different colors to the above figure. This is even more problematic here, because Petitioner does not explain why one of skill in the art would understand the middle of Zittel’s mixing chamber (19), identified in blue above, to be the rearward part. Petitioner does not argue that the middle portion and rearward portion would be considered the rearward part, but ignores the rearward portion completely and without explanation. The most rearward portion of Zittel’s mixing chamber (19) is not addressed by Petitioner and notably not highlighted in the above Figure. Petitioner’s assertions are insufficient to establish that Zittel teaches the claimed two-part mixing and dispensing element.

Zittel itself does not provide much detail about the mixing chamber (19). From Zittel’s Figures, the mixing chamber appears to be made from a single piece of material and the specification merely states that it is “made of a hardened metal material such 440C stainless steel.” Ex.1036, 4. Zittel does not include any disclosure or suggestion that the mixing chamber (19) is formed from two or more pieces of material. The Petition contains no explanation for how Zittel would teach the mixing chamber (19) being formed from two or more pieces of material. *See* Pet. 71–72, 85; *see also* Prelim. Resp. 43–44 (arguing the same).

Thus, the Petition fails to show how Zittel teaches or suggests this limitation.

b) Substantially Equal Cross-Sectional Areas

The Petition relies on the combination of Zittel, Fusion, and Hagfors for teaching this limitation, however, it primarily relies on the teachings of Fusion. Pet. 74–76, 86–87. The Petition asserts that “Fusion teaches variably

sized mixing chamber admission passages and spray orifices” (*id.* at 74), and thus, the respective cross-sectional areas can be determined which are “substantially equal because they have cross sectional areas within ten thousandths of an in.² of the sum of the areas of the mix chamber admission passages” (*id.* at 76).

Patent Owner argues that Petitioner’s analysis is based on an incorrect assumption:

that the Petition purports to calculate claimed “cross-sectional areas” using a *circular* area calculation ($A=\pi r^2$), but the Petition solely relies on Fusion’s “flat tip” orifice sizes for the “r” value in this calculation. Pet., 76. Fatally, the Fusion “flat tip” orifices were *not circular*, and that the “r” values Petitioner input into its πr^2 “area” calculations are *not actual circular radius dimensions of the “flat tip” orifices* at all. EX2001, ¶66. Accordingly, the Petition’s calculations on page 76 are premised on layers of errors that render the calculated areas incorrect and insufficient to demonstrate the claimed structure.

Prelim. Resp. 50.

In particular, Patent Owner’s declarant testifies that “[t]he Fusion brochure itself expressly indicates that the two tips are flat tips” and “the ‘FT0438 tip’ and the ‘FT0424 tip’ would have been understood as having a non-circular, three-dimensional ‘cat-eye’ shaped orifice which was used to achieve a flat spray pattern.” Ex. 2001 ¶ 68.

Patent Owner’s declarant further testifies that one of skill in the art would understand the difference between a flat tip and a round tip and that one of skill in the art “would have readily recognized that the non-circular geometry of the “flat tip” orifices lack a circular “diameter” in order to provide the flat spray pattern rather than a round spray pattern.” *Id.* ¶ 69.

We credit the testimony of Patent Owner’s declarant that one of skill in the art would have understood the difference between a flat tip and a

round tip and would understand that the size of Fusion's flat tips does not correspond to a circular diameter of the orifice size.

As the Petition uses incorrect assumptions concerning the disclosure of Fusion, the respective cross-sectional areas have not been determined. Thus, the Petition fails to show that the combination of Zittel, Fusion, and Hagfors teaches or suggests the substantially equal cross-sectional areas required by the claims.

For all of the above reasons, the Petition fails to identify how the combination of Zittel, Fusion, and Hagfors teaches or suggests the noted limitations of claims 1 and 10.

For the reasons expressed above, we determine that Petitioner has not established a reasonable likelihood that at least one claim is unpatentable.

4. Claims 2–5, 11, 12, 14

Claims 2–5, 11, 12, and 14 each depend from either claim 1 or 10. Thus, for at least the above reasons, the Petition also fails to identify how the combination of Zittel, Fusion, and Hagfors teaches or suggests all of the limitations of these dependent claims.

III. CONCLUSION

For the foregoing reasons, we do not institute trial.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), no *inter partes* review as to any claim of Patent US 7,527,172 B2 is instituted.

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