

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CHEMCO SYSTEMS, L.P.,
Petitioner,

v.

RDP TECHNOLOGIES, INC.,¹
Patent Owner.

IPR2019-01563
Patent 8,163,175 B2

Before JON B. TORNQUIST, JEFFREY W. ABRAHAM, and
JULIA HEANEY, *Administrative Patent Judges*.

TORNQUIST, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
Dismissing Patent Owner's Motion to Amend
35 U.S.C. § 318(a)

¹ The original caption identified RDP Company as the patent owner.
Paper 3. RDP Technologies, Inc., represents that it is now the owner of the
involved patent. Paper 4, 2.

I. INTRODUCTION

A. *Background and Summary*

Chemco Systems, L.P. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting an *inter partes* review of claims 1, 2, 4, 5, 7, and 11 of U.S. Patent No. 8,163,175 B2 (Ex. 1001, “the ’175 patent”). RDP Technologies, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition. Upon review of the parties’ arguments and supporting evidence, we instituted an *inter partes* review of all claims and grounds asserted in the Petition (Paper 11, “Institution Decision” or “Inst. Dec.”).

Patent Owner subsequently filed a Patent Owner Response (Paper 16, “PO Resp.”), Petitioner filed a Reply (Paper 27, “Pet. Reply”), and Patent Owner filed a Sur-Reply (Paper 30, “Sur-Reply”).

Patent Owner filed a Contingent Motion to Amend and Request for Preliminary Guidance (Paper 18, “MTA”), to which Petitioner filed a response (Paper 26). On September 18, 2020, we issued Preliminary Guidance with respect to the Motion to Amend. Paper 28. Subsequently, Patent Owner filed a reply to the Motion to Amend (Paper 29), and Petitioner filed a sur-reply (Paper 33).

In support of their respective arguments, Petitioner relies on the testimony of Mr. Lewis B. Benson (Ex. 1004), and Patent Owner relies on the testimony of Dr. David Hokanson (Ex. 2009) and Mr. Vincent Hart (Ex. 2010).

An oral hearing was held on December 1, 2020, and a transcript of the hearing is included in the record. Paper 37 (“Tr.”).

B. *Real Parties in Interest*

Petitioner identifies itself and Patent Owner identifies itself as the real parties in interest in this proceeding. Pet. 71; Paper 4, 2.

C. Related Matters

The parties identify *RDP Technologies, Inc. v. Chemco Systems, L.P.*, Case No. 2:18-cv-1161 (W.D. Pa.); IPR2019-01562 (challenging US 8,133,401) (institution denied); and IPR2019-01564 (challenging US 7,416,673) (institution granted) as related matters. Paper 4, 2–3; Pet. 71.

D. The '175 Patent

The '175 patent is directed to a method for removing unwanted grit from a lime slurry while allowing some grit to remain. Ex. 1001, 2:10–12. The '175 patent notes that various techniques have been attempted for separating unwanted grit from a lime slurry. *Id.* at 1:50–51. In one prior method, a gravity classifier was used to remove unwanted grit from a lime slurry delivered directly from a lime slaker. *Id.* at 1:52–56. The '175 patent reports, however, that this method is “unable to effectively remove particles smaller than 100 mesh (140 microns).” *Id.* at 1:56–57. Moreover, “gravity separation of grit, directly after the slaking of lime in a lime slaking device can be problematic, in that the amount and size of the grit removed will vary as the rate of discharge from the lime slaker varies.” *Id.* at 1:58–61.

In the system of the '175 patent, lime slurry produced in the lime slaker is delivered first to a slurry tank. *Id.* at 2:20–21, 2:52–53. From this slurry tank, the slurry may be extracted for use or delivered to a separation device for separation of some of the grit from the slurry. *Id.* at 2:52–56. After some grit is removed from the slurry by the separation device, the remaining slurry is recirculated to the slurry tank. *Id.* at 2:56–57.

Figure 1 depicts a first embodiment of the '175 patent and is reproduced below:

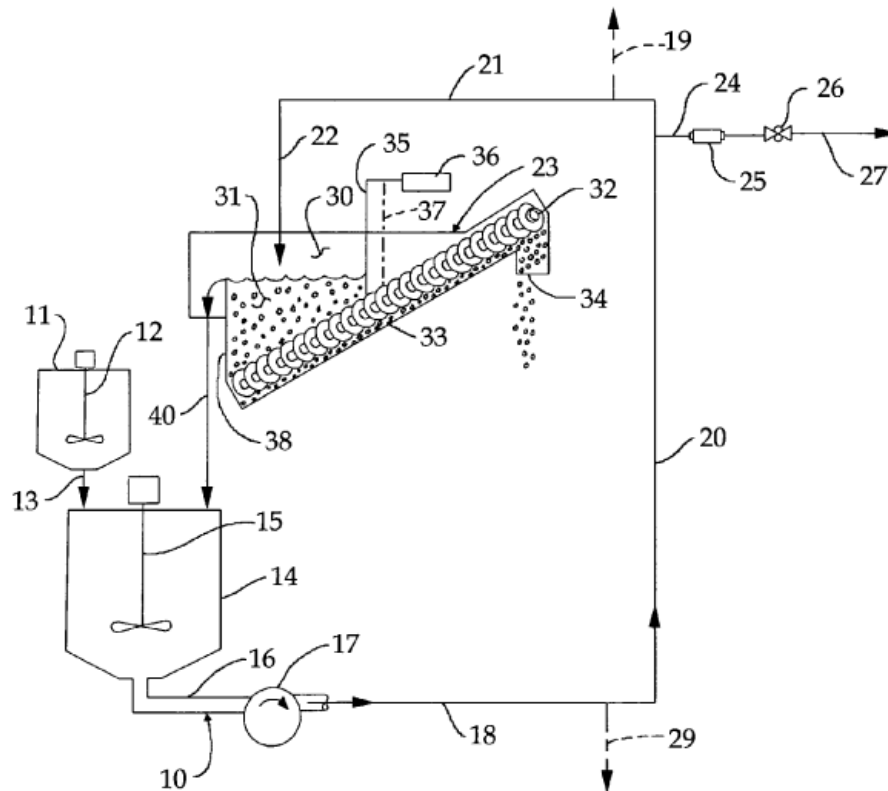


FIG. 1

Figure 1 is a flow diagram of a slurry treatment system. *Id.* at 2:52–60, 3:13–15. In the system depicted in Figure 1, lime slaker 11 delivers slaked lime via conduit 13 to slurry tank 14. *Id.* at 3:15–18. This watery lime slurry is then delivered via “a delivery line, conduit, or pipe 16, by means of a pump, to a delivery line 18, then to a grit classifier 23.” *Id.* at 3:22–26. The ’175 patent explains that “[d]uring the delivery of lime slurry as described above, to the grit classifier 23, some of the lime slurry may be extracted via extraction line 24, in a controlled manner, with the control being provided via flowmeter 25 and control valve 26.” *Id.* at 3:26–30; *see also id.* at 4:40–5:15 (noting that, depending on the desired level of grit at

the point of application, slurry may also be extracted from extraction lines 29 and 19 that are placed along delivery lines 18 and 21, respectively).

Grit classifier 23 includes tank 30 having a sloped auger 32, “the lower end of which is immersed within the liquid level 31, and which operates to engage grit particles and convey them up the sloped surface 33, to a point of discharge 34.” *Id.* at 3:33–37, 3:43–45. The upper edge of grit classifier wall 38 provides a means for overflow of lime slurry from grit classifier 23, via line 40, to slurry tank 14. *Id.* at 3:46–48.

Figure 2, reproduced below, depicts a second embodiment of the '175 patent.

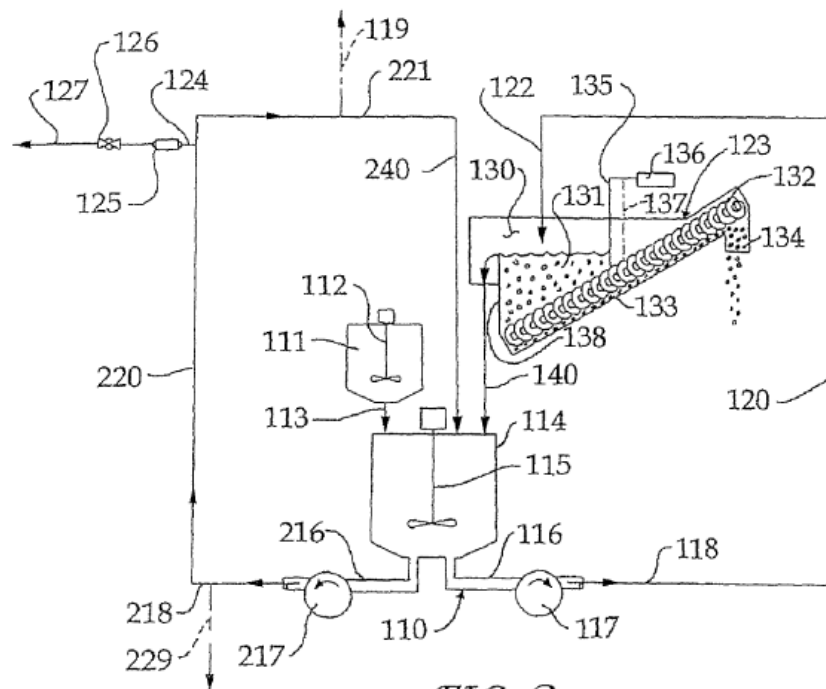


FIG. 2

Figure 2 is a flow diagram of a system “wherein the withdrawal of slurry from the slurry tank to the point of grit separation and return to the slurry tank is in a parallel flow arrangement to the extraction of slurry from the system.” *Id.* at 2:61–65.

As shown in Figure 2, slaker 111 delivers slaked lime via conduit or delivery line 113 to lime slurry tank 114. *Id.* at 4:7–10. Some of the discharge from slurry tank 114 is delivered via delivery line 116 to delivery lines, conduits, pipes 118, 120, and 121, as well as to delivery line 122 and gravity separation classifier 123. *Id.* at 4:13–18. Grit is separated from the slurry via gravity and delivered via auger 132 up slope 133 to grit discharge location 134. *Id.* at 4:17–21. Slurry with some grit removed is recirculated from grit classifier tank 123 to slurry tank 114 via conduit or delivery line 140. *Id.* at 4:22–25.

Parallel to the flow from slurry tank 114 via pump 117, pump 217 pumps watery lime slurry from slurry tank 114, via conduits or delivery lines 218, 220, 221, and 240, back into tank 114. *Id.* at 4:32–37. “During the course of such recirculation, extraction can occur via line 124” and the slurry may be delivered to the point of application via line 127. *Id.* at 4:37–39.

E. Illustrative Claims

Claims 1 and 7, reproduced below, are illustrative of the challenged claims.

1. Apparatus for treating lime slurry in a slurry treatment system, comprising:
 - (a) a slurry tank (14, 114) for a watery lime slurry having lime particles and grit particles therein;
 - (b) delivering line means (16, 18, 20; 216, 218, 220) for delivering slurry from the slurry tank to an extraction line (24, 124; 19, 119; 29, 229), for extracting a portion of the slurry delivered from the slurry tank;
 - (c) gravity separation means (23, 123, 32; 123, 132) for removing some grit from the lime slurry while allowing other grit to remain; wherein said means for removing is free of any means for adding dilution water to the gravity separation means (23, 32; 123, 132);

(d) conduit means (21, 122) substantially continuously delivering slurry taken from the slurry tank to the gravity separation means; and

(e) recirculation means (40, 140) for continuously recirculating the rest of the slurry to the slurry tank after separation of some of the grit from the slurry.

Ex. 1001, 5:32–6:6.

7. The apparatus of claim 1, including a lime slaking device (11, 111) for providing lime slurry to the slurry tank.

Id. at 6:28–29.

F. Prior Art and Asserted Grounds

Petitioner contends claims 1, 2, 4, 5, 7, and 11 of the '175 patent are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 2, 7, 11	103 ²	Muzik, ³
4, 5	103	Muzik, Westerberg ⁴
1, 2, 11	103	Underwood, ⁵ Pesotini ⁶
4, 5	103	Underwood, Pesotini, Westerberg
7	103	Underwood, Pesotini, Muzik

II. ANALYSIS

A. Legal Standards

To prevail in its challenge to claims 1, 2, 4, 5, 7, and 11 of the '175 patent, Petitioner has the burden to establish by a preponderance of the

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the '175 patent issued was filed before this date, the pre-AIA version of § 103 applies.

³ Muzik, US 5,336,481, issued August 9, 1994 (Ex. 1010).

⁴ Westerberg, US 5,145,556, issued September 8, 1992 (Ex. 1015).

⁵ Underwood, US 4,779,992, issued October 25, 1988 (Ex. 1011).

⁶ Pesotini, US 5,368,731, issued November 29, 1994 (Ex. 1012).

evidence that the challenged claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2019). This burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

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

B. Level of Ordinary Skill in the Art

Petitioner contends one of ordinary skill in the art “would have possessed at least a bachelor’s degree in civil engineering, chemical engineering, or mechanical engineering with at least two years of industry experience with lime slaking systems (or equivalent degree or experience).” Pet. 7 (citing Ex. 1004 ¶¶ 18–19). Petitioner further contends that “[a] person could also have qualified as a [person of ordinary skill in the art] with some combination of (1) more formal education (such as a master’s of science degree) and less technical experience, or (2) less formal education and more technical or professional experience.” *Id.*

Patent Owner contends one of ordinary skill in the art “would have had a bachelor’s degree in environmental engineering, civil engineering, or

environmental science and/or at least two years of hands-on experience in the water treatment industry with an emphasis on lime slaking technology.” PO Resp. 9–10 (citing Ex. 2009 ¶ 29).

Upon review of the parties’ arguments and supporting evidence, we adopt Patent Owner’s definition of one of ordinary skill in the art, as it is consistent with the disclosures of the ’175 patent and the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art). We note, however, that neither party contends that any issue in this case turns on the differences between the parties’ definitions of one of ordinary skill in the art. *See* Ex. 2009 ¶¶ 30–31.

C. Claim Construction

In this proceeding, the claims of the ’175 patent are construed “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).” 37 C.F.R. § 42.100(b) (2019). Under that standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have had to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

The parties dispute the proper construction of the terms “slurry tank,” “delivering line means,” and “controlling means.” Pet. 10–13; PO Resp. 11–19; Pet. Reply 3–5; Sur-Reply 2–5. For purposes of this decision, we need only address the meaning of the terms “slurry tank” and “delivering line means.” *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be

construed that are in controversy, and only to the extent necessary to resolve the controversy.”)).

1. “slurry tank”

Claim 1 of the ’175 patent requires “a slurry tank (14, 114) for a watery lime slurry having lime particles and grit particles therein.”

Ex. 1001, 5:34–35. Both parties agree that a “slurry tank” is “a tank for holding slurry produced through a lime slaking process.” PO Resp. 12, 19; Pet. Reply 1–4; Sur-Reply 3. Patent Owner asserts, however, that the intrinsic record makes clear that a “lime slaker” is not a “slurry tank.” PO Resp. 12; Sur-Reply 3–4.

Neither party asserts that the term “slurry tank” has an established meaning in the art. Tr. 25:20–26:4. Accordingly, we must determine the meaning of this term from the intrinsic evidence of record, including the claims, the written description, and the relevant prosecution history.

See Philips, 415 F.3d at 1321 (“Properly viewed, the ‘ordinary meaning’ of a claim term is its meaning to the ordinary artisan after reading the entire patent.”); *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, 711 F.3d 1348, 1361 (Fed. Cir. 2013) (“If, however, the claim term does not have an ordinary meaning, and its meaning is not clear from a plain reading of the claim, ‘we turn to the remaining intrinsic evidence, including the written description, to aid in our construction of that term.’” (quoting *Telemac Cellular Corp. v. Topp Telecom, Inc.*, 247 F.3d 1316, 1326 (Fed. Cir. 2001))).

a) Claims

Claim 1 recites a “slurry tank” that contains “a watery lime slurry having lime particles and grit particles therein” and the ’175 patent explains that lime slurry is produced in a “lime slaking” process. Ex. 1001, 1:22–27,

5:34–35. These disclosures support the parties’ construction of “slurry tank” as “a tank for holding slurry produced through a lime slaking process.”

PO Resp. 12, 19; Pet. Reply 1–4; Sur-Reply 3.

Claim 7 depends from claim 1 and further requires “a lime slaking device (11, 111) for providing lime slurry to the slurry tank.” Ex. 1001, 6:28–29. The requirements for a “slurry tank” in claim 1 and for “a lime slaking device” in dependent claim 7 generally support Patent Owner’s argument that the terms “slurry tank” and “lime slaking device” have different meanings. *See Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d 1322, 1330 (Fed. Cir. 2009) (“When different words or phrases are used in separate claims, a difference in meaning is presumed.” (quoting *Nystrom v. TREX Co.*, 424 F.3d 1136, 1143 (Fed. Cir. 2005))). The language and structure of claims 1 and 7, however, do not serve to explain exactly what the difference is between a “slurry tank” and a “lime slaking device.”

b) Written Description

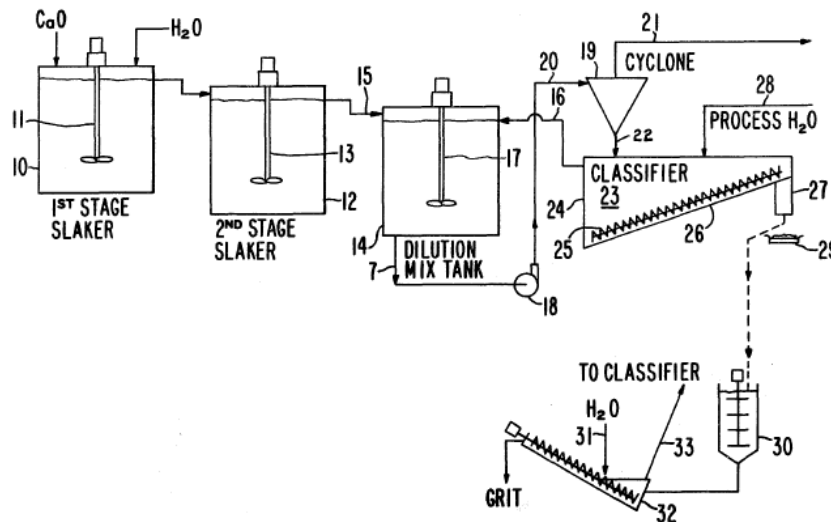
The ’175 patent explains that the process of mixing lime in the form of calcium oxide (CaO) with excess water to form calcium hydroxide is commonly referred to as “lime slaking” and that lime slaking is “accomplished in a device known as a lime slaker.” Ex. 1001, 1:20–27. This confirms that a tank where calcium oxide is mixed with excess water to form a lime slurry is a “lime slaker,” and implies that such a tank is not a “slurry tank.”

The remaining disclosures of the ’175 patent further support Patent Owner’s argument that a “lime slaker” is distinct from a “slurry tank.” For example, Figure 1 of the ’175 patent identifies the device in which lime and water are mixed as “lime slaker 11” and the tank that receives slaked lime from slaker 11 via conduit 13 as “slurry tank 14.” Ex. 1001, 3:15–18, Figs.

1–2. The '175 patent also notes that prior art methods of separating grit from a lime slurry immediately after discharging the slurry from a lime slaker suffered difficulties. *Id.* at 1:52–67 (“The gravity separation of grit, directly after the slaking of lime in a lime slaking device can be problematic . . .”). The '175 patent solves these problems, in part, by removing grit particles from a lime slurry that is taken from a slurry tank, as opposed to directly from a lime slaker. *Id.* at 2:18–25. This supports Patent Owner’s argument that a lime slaker is not a “slurry tank.”

c) Prosecution History

During prosecution, the pending claims were rejected as anticipated by, and as having been obvious over, Emmett. *See, e.g.*, Ex. 1006, 303–304, 355–356.⁷ The Figure of Emmett, reproduced below, depicts Emmett’s lime slaking system:



The Figure of Emmett is a partially schematic illustration of a lime slaking system. Ex. 1009, 3:53–55. In the disclosed system, calcium oxide is reacted with clean water in vessel 10 and then the lime slurry from this first

⁷ Our citations to Exhibit 1006 are to the page numbers added at the lower right-hand corner of the document.

stage slaker is fed into second stage slaker 12. *Id.* at 3:58–61, 4:31–40. Overflow 15 from second stage slaker 12 is then fed into dilution mix tank 14. *Id.* at 4:54–55. Diluted slurry is then conveyed from dilution mix tank 14 through outlet 7 to hydrocyclone 19, which is the primary grit removal device in Emmett’s system. *Id.* at 4:59–62. The overflow from hydrocyclone 19 is the useful product and is distributed through overflow line 21. *Id.* at 5:36–40. Underflow 22 from hydrocyclone 19 drops into inlet pool 23 of classifier 24 where spiral screw 25 conveys settled grit along inclined trough 26 to grit discharge box 27. *Id.* at 5:41–50. Slurry from pool 23 is provided via inlet 16 to dilution mix tank 14, thereby forming a slurry recirculation loop. *Id.* at 4:55–59.

During prosecution, the Examiner identified dilution mix tank 14 of Emmett as the “slurry tank” of claim 1. Ex. 1006, 339–340, 355–356. Patent Owner argues that because the Examiner did not identify the first or second stage slakers of Emmett as a “slurry tank,” this is evidence that the Examiner did not consider any portion of a slaker to be a “slurry tank.” PO Resp. 16–17. We disagree.

First stage slaker 10, second stage slaker 12, and dilution mix tank 14 of Emmett are tanks that contain a watery lime slurry. Emmett’s first and second stage slakers 10 and 12, however, do not connect to a “delivering line means” for delivering slurry from the slurry tank to an extraction line, or a “recirculation means” for continuously recirculating the rest of the slurry to the tank, as recited in claim 1. Ex. 1001, 5:36–39, 6:4–6. Thus, even if the Examiner considered the first or second stage slaker of Emmett to be a “slurry tank,” the Examiner could not identify either of these slakers as the “slurry tank” of claim 1.

In view of the foregoing, we find that the prosecution history identified by Patent Owner does not provide helpful guidance as to the meaning of the term “slurry tank.”

d) Conclusion

The claims of the '175 patent indicate that a lime slaking device is distinct from a slurry tank, the written description of the '175 patent expressly defines a “lime slaker” as a tank wherein lime and water are mixed to form a lime slurry, and the figures and description of the claimed invention consistently differentiate a “lime slaker” from a “slurry tank.” Thus, for the reasons given in our analysis above, we construe the term “slurry tank” to be “a tank for holding slurry produced through a lime slaking process” and find that a “lime slaker,” into which lime and water are charged, is different from a “slurry tank.”

2. “delivering line means”

Claim 1(b) recites a “delivering line means (16, 18, 20; 216, 218, 220) for delivering slurry from the slurry tank to an extraction line (24, 124; 19, 119; 29, 229), for extracting a portion of the slurry delivered from the slurry tank.” Ex. 1001, 5:36–39. In the Institution Decision, we construed the function of this means-plus-function claim term to be “delivering slurry from the slurry tank to an extraction line” and the corresponding structure to be that identified as lines 16, 18, 20 in Figure 1 and lines 216, 218, and 220 in Figure 2. Inst. Dec. 6–7. Neither party disputes this construction, but the parties disagree as to what the language of the claim actually requires.

PO Resp. 11; Pet. Reply 10–12; Sur-Reply 5, 8. We address this dispute below in the context of the obviousness ground based on Muzik.⁸

D. Claims 1, 2, 7, and 11 over Muzik

Petitioner contends the subject matter of claims 1, 2, 7, and 11 of the '175 patent would have been obvious over Muzik. Pet. 25–43.

1. Muzik

Muzik discloses “a slaking apparatus” that is designed “for the continuous slaking of relatively small amounts of lime.” Ex. 1010, 1:8–11. Figure 1 of Muzik is reproduced below.

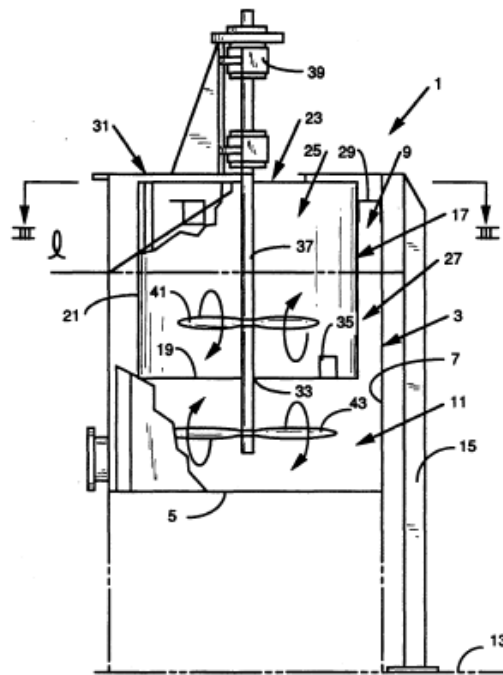


FIG. 1

Figure 1 of Muzik “is a side elevational view, with portions cut away,” of “compact lime slaking apparatus 1.” *Id.* at 2:53–55, 3:10–11. Slaking apparatus 1 contains inner vessel 17 (having bottom wall 19, upwardly extending side wall 21, and open top 23) that is disposed within outer

⁸ We also address below whether the “delivering line means” may be the same structure as the “conduit means.”

vessel 3 (having bottom wall 5, upwardly extending side wall 7, and open top 9). *Id.* at 3:13–26. According to Muzik, inner vessel 17 constitutes initial slaking chamber 25 and outer vessel 3 constitutes final slaking chamber 11. *Id.* at 3:11–21.

Muzik explains that lime and water are charged into initial slaking chamber 25 and “agitated to slake the lime with a resulting exotherm.” *Id.* at 2:30–32. “The slaked lime” is then “passed from the initial slaking chamber” to the “final slaking chamber that surrounds the initial slaking chamber, so that hot slaked lime insulates the contents of the initial slaking chamber.” *Id.* at 2:32–36.

Figure 5 of Muzik is reproduced below:

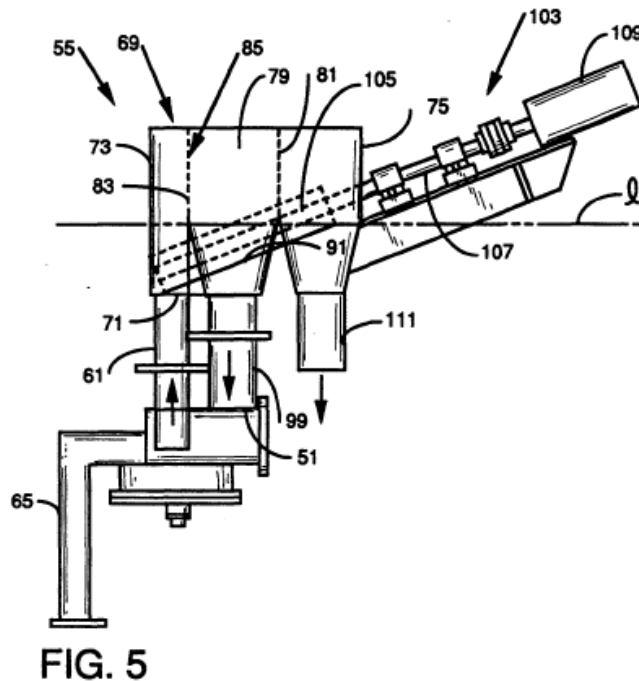


Figure 5 is a side elevational view of the collection trough and grit removal device of Muzik. *Id.* at 2:63–65. In operation, lime slurry from final slaking chamber 11 is delivered through outlet conduit 51 and column 61 to collection trough 55. *Id.* at 3:51–4:12. Muzik explains that grit will tend to

sink to the bottom of this compartment, whereas lime slurry with at least a portion of the grit removed will overflow wall 89 (not shown) and be directed to final slaking chamber 11 via return conduit 99, thus forming a slurry recirculation loop. *Id.* at 4:26–36.

Slaked lime product and grit in settling and separation compartment 87 (not identified in Figure 5) are moved by screw conveyor 103 to product discharge conduit 111 where they are removed from slaking apparatus 1. *Id.* at 4:48–51. “The grit is then removed, as is conventional, by passage through a screen or other solids removal device (not shown), and the slaked lime [is] used for the purpose for which it was produced.” *Id.* at 4:51–55.

2. *Analysis: Claim 1*

Petitioner contends Muzik teaches or suggests every limitation of claim 1, including (1) a slurry tank (outer vessel 3) containing a watery lime slurry having lime particles and grit particles therein (Pet. 26–27); (2) a delivering line means (outlet conduit 51 and column 61) for delivering slurry from the slurry tank to an extraction line (product discharge conduit 111) for extracting a portion of the slurry delivered from the slurry tank (*id.* at 28–31); (3) a gravity separation means (settling and separation compartment 87 and screw conveyor 103) for removing some grit from the lime slurry while allowing other grit to remain (*id.* at 31–34); (4) a conduit means (conduit 51 and column 61) substantially continuously delivering slurry taken from the slurry tank to the gravity separation means (*id.* at 34–36); and (5) a recirculation means (return conduit 99) for continuously recirculating the rest of the slurry to the slurry tank after separation of some of the grit from the slurry (*id.* at 36–39).

Patent Owner contends the grounds based on Muzik fail because (a) Muzik does not disclose a “slurry tank,” (b) Muzik does not disclose a “delivering line means” that delivers slurry from the slurry tank to the extraction line, and (c) Petitioner improperly identifies the same structure of Muzik as both the delivering line means and the conduit means of claim 1. PO Resp. 20–35. We address these arguments in turn.

a) Slurry Tank

Patent Owner argues that Muzik’s “final slaking chamber” is not a “slurry tank” because it “does not include a tank for holding any slurry, let alone a tank for holding slurry produced through a lime slaking process.” PO Resp. 23–24 (citing Ex. 2009 ¶¶ 112–114).

The slaking apparatus of Muzik contains two chambers or tanks. Ex. 1010, 2:30–37, 3:10–26. In the first chamber, lime and water are mixed together and agitated “to slake the lime with a resulting exotherm.” *Id.* at 2:30–32. “The slaked lime” (past tense) is then “passed from the initial slaking chamber to a final slaking chamber that surrounds the initial slaking chamber, so that hot slaked lime” (past tense) “insulates the contents of the initial slaking chamber.” *Id.* at 2:32–37. “Slaked lime” is then pumped from the final slaking chamber to a collection trough, from which “slaked lime” is either discharged for use or “returned to the final slaking chamber.” *Id.* at 2:38–43. Because it is “slaked lime” that is transferred to, and held for a period of time in, final slaking chamber 11, and because calcium oxide and water are not mixed into final slaking chamber 11, we agree with Petitioner that outer vessel 3 of Muzik is a “slurry tank.”⁹ Ex. 1004 ¶ 81; Ex. 1021,

⁹ Final slaking chamber 11 of Muzik and slurry tank 14 of the ’175 patent both receive “slaked lime” from a lime slaker, both hold this slaked lime for a period of time, and both are the initiation point of the slurry recirculation

107:22–108:8, 114:14–20; Ex. 1010, 3:10–15, 4:26–36, Figs. 1, 2, 5. Thus, we find that Muzik discloses a “slurry tank,” as recited in claim 1.

b) “delivering line means”

The term “delivering line means” in claim 1 is a means-plus-function limitation; the function of this limitation is “delivering slurry from the slurry tank to an extraction line,” and the corresponding structure identified in the ’175 patent for achieving this function is delivery lines, conduits, or pipes 16, 18, 20 and 216, 218, 220 in Figures 1 and 2. Pet. 10; PO Resp. 11; Sur-Reply 5; *see* Inst. Dec. 6–7.

Petitioner contends outlet conduit 51 and column 61 in Muzik act as a “delivering line means” for “delivering slurry from the slurry tank to an extraction line.” Pet. 28–31; Pet. Reply 21–23.

Patent Owner contends outlet conduit 51 and column 61 are not by themselves a “delivering line means” because they “do not deliver slurry from the tank to an extraction line.” PO Resp. 26.

Petitioner responds that “[t]o” in this claim limitation means “in a direction towards” and “Muzik’s conduits 51, 61 deliver slurry in the direction towards the extraction line in precisely the way that the ’175 patent’s conduits 16, 18, 20 do.” Pet. Reply 23 (citing Ex. 1022; 1021, 112:24–113:6). Petitioner further contends “claim 1’s open ended ‘Apparatus . . . , comprising:’” language allows structures beyond conduits 16, 18, and 20 to deliver slurry from the slurry tank to the extraction line. *Id.* at 22–23.

loop. Ex. 1001, 3:15–18; Ex. 1010, 2:33–35. Patent Owner provides no persuasive explanation as to why tanks that function in essentially the same manner would constitute a “lime slaker” in Muzik but a “slurry tank” in the ’175 patent.

As noted by Petitioner, the word “to” can mean “[i]n a direction toward” a particular point. Ex. 1022. The use of the terms “from” and “to” in combination, however, strongly suggests that the “delivering line means” carries slurry “from” the slurry tank all the way “to” the “extraction line.” See Ex. 1006, 293 (applicants explaining during prosecution that “the delivery destination of the delivery means is now specific, as being ‘to an extraction line’”). Indeed, the ’175 patent provides no example, description, or figure wherein a “delivering line means” does not provide slurry from the “slurry tank” all the way to the “extraction line.” See Ex. 1001, Figs. 1, 2. Accordingly, based on the specification of the ’175 patent, we agree with Patent Owner that the function of the recited “delivering line means” requires delivering slurry from the slurry tank all the way to the extraction line.

Moreover, contrary to Petitioner’s arguments, the use of open ended “comprising” language may not expand the scope of a means-plus-function claim term beyond the corresponding structure(s) identified in the specification and equivalents thereof, and Petitioner does not contend that the intervening trough and screw conveyor of Muzik, which are located between column 61 and extraction line 111, are conduits/pipes/delivery lines or equivalents thereof. See *Odetics, Inc. v. Storage Tech. Corp.*, 185 F.3d 1259, 1267–68 (Fed. Cir. 1999) (construing an open-ended “comprising” claim with means-plus-function claim terms as being limited to “the corresponding structure, materials, or acts described in the specification and equivalents thereof”); Pet. 30; PO Resp. 29; Tr. 90:3–10; Ex. 1001, Figs. 1, 2; see also Ex. 2009 ¶ 123 (Dr. Hokanson testifying that the trough and screw conveyor that lie between conduits 51 and column 61 and extraction line 111 in Muzik are “different in kind” to the “conduit, pipe, or delivery

line” structures both parties agree are the corresponding structure for the “delivering line means” of claim 1).

Because we agree with Patent Owner that the “delivering line means” must deliver slurry from the slurry tank to the extraction line, and that conduit 51 and column 61 of Muzik do not deliver slurry from the slurry tank all the way to an extraction line, we are not persuaded that Muzik discloses the “delivering line means” of claim 1.¹⁰ PO Resp. 30–31.

c) Overlapping Claim Terms

Petitioner identifies outlet conduit 51 and column 61 of Muzik as both the claimed “delivering line means” and “conduit means.” Pet. 28–31, 34–36. Patent Owner argues Petitioner errs in identifying the same structure for both claim limitations because those elements are “distinct components” of the patented invention. PO Resp. 34–35 (quoting *Becton, Dickinson and Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)).

Claim 1 is directed to an apparatus and lists the “delivering line means” separately from the “conduit means.” Ex. 1001, 5:32–6:3. “Where a claim lists elements separately, ‘the clear implication of the claim language’ is that those elements are ‘distinct components’ of the patented

¹⁰ In the Institution Decision, we noted that Patent Owner had not explained sufficiently why claim 1 precludes an intervening chamber or device within the “delivering line means.” Inst. Dec. 13. The structures identified as the claimed “delivering line means” must, however, in combination, perform the recited function, i.e., delivering line slurry from a particular location (the slurry tank) to a particular location (the extraction line), and must be at least equivalent to the corresponding structure(s) identified in the patent for achieving this function. Ex. 1001, 5:36–39; Ex. 1006, 293 (applicants explaining during prosecution that “the delivery destination of the delivery means is now specific, as being ‘to an extraction line’”).

invention.” *Becton, Dickinson*, 616 F.3d at 1254 (quoting *Gaus v. Conair Corp.*, 363 F.3d 1284, 1288 (Fed. Cir. 2004)).

The implication that separate claim elements are distinct components may be overcome if the intrinsic evidence fairly suggests that the two elements can be the same structure. *Id.* Petitioner contends that because Figure 1 of the ’175 patent only includes one conduit from slurry tank 14, in order “to map claim 1’s two conduits ‘from the slurry tank’ onto ’175 patent Fig. 1, one would have to cite conduits 18, 20 twice.” Pet. Reply 23–24. Thus, according to Petitioner, “the Petition’s mappings for the ‘delivering line means’ and ‘conduit means’ are sound for claim 1’s express language.” *Id.* at 24. We disagree. The express language of claim 1 does not require that the “conduit means” takes slurry directly from the slurry tank; rather, the claim language only requires that it delivers slurry that has been “taken” from the slurry tank to the gravity separation means.¹¹ See Ex. 1001, 5:36–39. Moreover, in every disclosed embodiment of the ’175 patent, the

¹¹ As originally filed, claim 1 required that both the “delivering line means” and “conduit means” deliver slurry “from the slurry tank.” Ex. 1006, 366. The Examiner rejected the claim because it was “unclear how the claimed, ‘**conduit means**’ of what is now clause ‘d’ differs from the ‘delivering line means’ of clause ‘b.’” Ex. 1006, 300. In response, the Applicant amended claim 1 to indicate that the “delivering line means” delivers “slurry from the slurry tank via a delivery line to an extraction line (24, 124)” and the “conduit means” delivers slurry “taken from the slurry tank to the means for gravity separation.” *Id.* at 295; Ex. 1001, 5:36–39, 6:1–3. Thus, in contrast to the “delivering line means,” the “conduit means” need not be connected to the “slurry tank” and may deliver slurry that has already been taken from the slurry tank by another component to the gravity separation means. Ex. 1001, 5:36–39, 6:1–3; Tr. 92:20–94:7 (discussing the addition during prosecution of the term “taken” to clause “d”). That is what is depicted in Figure 1 of the ’175 patent. *Id.* at Fig. 1.

“delivering line means” and the “conduit means” are completely different structures, either in the same or different slurry recirculation loops. *Id.* at Figs. 1, 2.

Petitioner contends that Dr. Hokanson and Mr. Hart admitted during cross-examination that the “delivering line means” and the “conduit means” both start at the slurry tank. Pet. Reply 14 n.2 (citing Ex. 1020, 79:11–13, 80:4–6; Ex. 1021, 45:3–5, 47:7–11). During cross-examination, Dr. Hokanson testified that limitation 1(d) of the ’175 patent “begins with slurry from the slurry tank.” Ex. 1021, 47:3–11. But this testimony is consistent with limitation 1(d) starting with slurry that been “taken from the slurry tank” and Petitioner’s counsel never followed up to further clarify Dr. Hokanson’s testimony. Dr. Hart indeed testified that both the “delivering line means” and “conduit means” start at the slurry tank and include overlapping structures. Ex. 1020, 79:3–80:6. Dr. Hart’s testimony, however, was limited to addressing secondary considerations of non-obviousness, and he did not analyze the claims for purposes of unpatentability or the nexus requirement for secondary considerations. Ex. 2010 ¶ 22; Pet. Reply 27 n.4; Tr. 33:5–6, 78:10–79:1. Thus, although Dr. Hart’s testimony calls into question his conclusions regarding secondary considerations set forth in his declaration, it is not sufficient to demonstrate that the intrinsic evidence of record fairly suggests that the “delivering line means” and “conduit means” of claim 1 may be the same structures.

In view of the foregoing, we find that the separate listing of the “delivering line means” and “conduit means” implies that these elements are distinct components, and that Petitioner has not adequately demonstrated that the intrinsic evidence of record fairly suggests that the “delivering line means” and the “conduit means” of claim 1 may be the same structure. *See*

Becton, Dickinson, 616 F.3d at 1254–55. Accordingly, because Petitioner identifies the same structure of Muzik (outlet conduit 51 and column 61) as constituting both the “delivering line means” and the “conduit means,” it has not demonstrated sufficiently that Muzik teaches or suggests the “delivering line means” and “conduit means” limitations of claim 1 of the ’175 patent.

d) Conclusion with Respect to Claim 1

Petitioner fails to adequately demonstrate that Muzik discloses the “delivering line means” and “conduit means” limitations of claim 1 of the ’175 patent. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claim 1 would have been unpatentable as obvious over Muzik.

3. Analysis: Dependent Claims 2, 7, and 11

Claims 2, 7, and 11 each depend from independent claim 1. Ex. 1001, 6:7–10, 6:28–29, 6:41–42. Petitioner’s arguments with respect to dependent claims 2, 7, and 11 do not resolve the issues discussed above with respect to independent claim 1. *See* Pet. 39–43. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claims 2, 7, and 11 would have been unpatentable as obvious over Muzik.

E. Claims 4 and 5 over Muzik and Westerberg

Claims 4 and 5 depend, directly or indirectly, from claim 1. Ex. 1001, 6:17–23. Petitioner contends the subject matter of claims 4 and 5 would have been obvious over the combined disclosures of Muzik and Westerberg. Pet. 44–47. Petitioner’s arguments with respect to these claims, however, do not resolve the issues discussed above with respect to independent claim 1. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claims 4 and 5 would have been unpatentable as obvious over Muzik and Westerberg.

F. Claims 1, 2, and 11 over Underwood and Pesotini

Petitioner contends the subject matter of claims 1, 2, and 11 would have been obvious over the combined disclosures of Underwood and Pesotini. Pet. 48–64.

1. Underwood

Underwood discloses “a method and apparatus for the continuous preparation of a slurry of a liquid and a solid compatible with the liquid,” such as “an aqueous slurry of calcium hydroxide.” Ex. 1011, 1:5–8. Underwood notes that prior art apparatus for continuous mixing of slurry included a “mixing vessel and beaters for agitating the contents of the vessel.” *Id.* at 1:9–13. According to Underwood, “[o]ften, in such apparatus, large solid particles are not properly mixed within the slurry and settle, particularly on the bottom of the vessel and on grates through which the slurry flows,” and “seals and bearings” within the apparatus come into contact “with the slurry, which contains abrasive materials.” *Id.* at 1:13–18. Thus, Underwood explains it is “desired to develop a mixing vessel which eliminates the above-mentioned drawbacks of the prior art.” *Id.* at 1:19–22.

Figures 1 and 2 of Underwood are reproduced below:

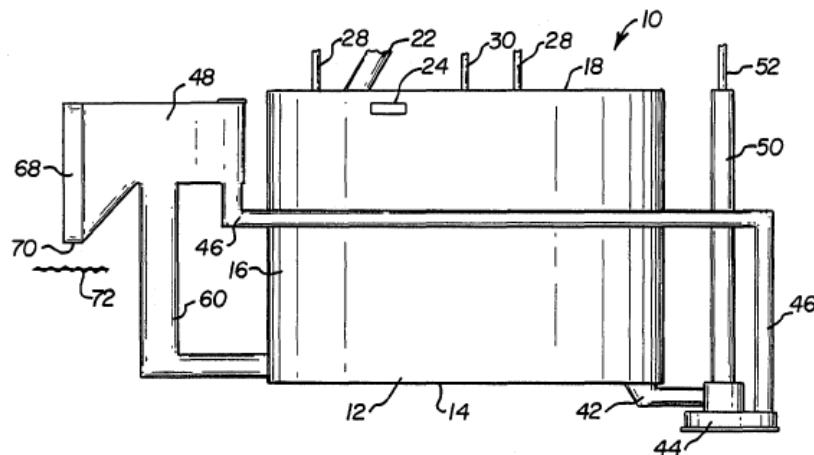


FIG. 1

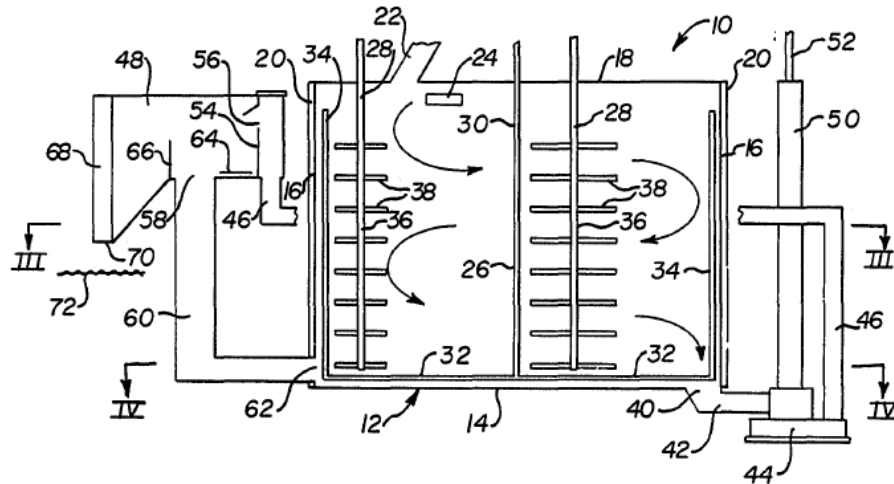


FIG. 2

Figure 1 is a side plan view of the slaker of Underwood, and Figure 2 is a side sectional view of the slaker of Figure 1. *Id.* at 2:58–61. As shown in Figure 1, slaker 10 includes mixing vessel 12 having a substantially uniform circular cross-section. *Id.* at 3:4–8. Solid matter, preferably lime, is introduced through solid feed inlet 22 at the top of mixing vessel 12 and liquid, preferably water, is introduced through liquid feed inlet 24. *Id.* at 3:12–18. Contents of the vessel are then mixed by low speed sweeper 26 and high speed beaters 28. *Id.* at 3:26–28.

Underwood explains that if the solids introduced through solid feed inlet 22 “contain insolubles, or otherwise deleterious materials, the ratio of solid [to] liquid feeds should be such that the resulting slurry is heavy enough and viscous enough to inhibit the fallout of the deleterious materials.” *Id.* at 3:20–25. Underwood further explains that blades 32 and 34 of low speed sweeper 26 “are close enough to the bottom 14 and sidewall 16, respectively, of the mixing vessel 12 to prevent any substantial build up of solid material, but are not so close as to crush the largest solid particles fed into the mixing vessel 12.” *Id.* at 3:43–47.

The slurry formed in mixing vessel 12 is discharged through outlet 40 to outlet conduit 42, which extends from bottom 14 of mixing vessel 12. *Id.* at 4:7–9. Pump 44 circulates the slurry from outlet conduit 42 through conduit 46 to weir box 48. *Id.* at 4:9–11. Slurry is then returned from weir box 48 to mixing vessel 12 via outlet 58, conduit 60, and inlet 62. *Id.* at 4:26–30.

In a preferred embodiment, mixing vessel 12 is filled with water until pump 44 can maintain a steady flow of water through the identified system without cavitating. *Id.* at 4:41–46. The sweeper and beaters are then actuated and the liquid and solid feeds turned on. *Id.* at 4:46–51.

When the volume of the slurry has increased to the point that the top level of the slurry reaches the level of the top of the weir 66 so that additional feed will cause the slurry to flow over the weir 66, the feed is stopped and the slurry is circulated until the temperature of the slurry in the mixing vessel 12 reaches at least about 160° F. due to the exothermic nature of the reaction occurring within the mixing vessel 12. The feeds are again turned on at the predetermined feed rate. The level of the slurry in the vessel 12, and the weir box 48, will rise to the extent that the slurry flowing over the weir 66 into the exiting chamber 68 equals the feed input rate.

As an increment of feed is dropped on to the top surface of the slurry in the mixing vessel 12, it is absorbed into the slurry and immediately begins to swirl around the interior of the mixing vessel 12. The resulting slurrified material displaces its equivalent mass of slurry from the mixing vessel 12 Thus, a constant volume is maintained within the slaker 10 during normal operation.

Id. at 4:54–5:8.

particles therein,” as recited in claim 1(a) (*id.* at 50–51); (3) Underwood’s outlet conduit 42 and conduit 46, which deliver slurry from mixing vessel 12 to weir box 48, constitute a “delivering line means” that delivers slurry from the slurry tank to an extraction line (i.e., exiting chamber 68 and discharge outlet 70), as recited in claim 1(b) (*id.* at 51–53); (4) Pesotini’s grit classifier is a “gravity separation means” that is free of any means for adding dilution water and removes “some grit from the lime slurry while allowing other grit to remain,” as recited in claim 1(c) (*id.* at 54–57); (5) Underwood’s conduits 42, 46, and/or 60 are a “conduit means” for substantially continuously delivering slurry taken from the slurry tank to Pesotini’s “gravity separation means,” as recited in claim 1(d) (*id.* at 57–59); and (6) Underwood’s conduits 42, 46, and/or 60 leading to recirculation inlet 62 are a “recirculation means . . . for continuously recirculating the rest of the slurry to the slurry tank after separation of some of the grit from the slurry,” as recited in claim 1(e) (*id.* at 59–61).

Petitioner contends a person of ordinary skill in the art would have understood “that Pesotini’s grit classifier would reduce grit build-up throughout its slurry loop” and would have sought to implement Pesotini’s grit classifier in Underwood in order “to alleviate some of the grit build-up issues contemplated in Underwood.” *Id.* at 56 (citing Ex. 1004 ¶ 230).

Patent Owner contends the grounds based on Underwood and Pesotini fail because Petitioner has not demonstrated: (a) that one of ordinary skill in the art would have combined the disclosures of Underwood and Pesotini; (b) that Underwood discloses a slurry tank; and (c) that Underwood teaches or suggests the structures identified in the ’175 patent for performing the functions of at least two recited means-plus-function claim terms. PO Resp. 37–53. We address the first two arguments below.

a) *Reason to Combine Underwood and Pesotini*

Petitioner contends one of ordinary skill in the art would have been “motivated to combine Underwood’s recirculation loop with Pesotini’s classifier to alleviate some of the grit build-up issues contemplated in Underwood.” Pet. 56. As noted by Petitioner, Underwood acknowledges that grit is often undesirable. Pet. 48–49 (citing Ex. 1011, 3:43–47, 4:37–40). In particular, Underwood discloses that large particles that are not properly mixed may settle on the bottom of the vessel and on grates through which the slurry flows, and that the abrasive materials in the slurry may degrade seals and bearings that come into contact with these materials. Ex. 1011, 1:10–22. The potential grit build-up problems identified in Underwood, however, are eliminated, or at least sufficiently rectified, by its disclosed system, “which eliminates the above-mentioned drawbacks of the prior art.” *Id.* at 1:19–22, 3:45, 3:67–68. Thus, we are not persuaded that the problems identified and overcome in Underwood would have motivated one of ordinary skill in the art to add the grit classifier system of Pesotini to Underwood’s recirculation system.

In its Reply, Petitioner argues that “in some instances, a lower density slurry may be desired” and that this lower density slurry may result in “slurry grit level accumulations and corresponding” higher wear on components. Pet. Reply 18 (citing Ex. 1004 ¶ 208). Petitioner further argues that because Pesotini’s grit-removal system would mitigate some of these grit accumulation and wear issues, “the Petition’s motivation to combine Underwood and Pesotini is sound.” *Id.*

Petitioner’s arguments about lower density slurry are supported by the testimony of Dr. Benson, who asserts that even with Underwood’s grit mitigation measures, “grit may still accumulate, for example, when slaked

lime slurry of lower density must be produced.” Ex. 1004 ¶ 208.

Dr. Benson’s assertions, however, are not supported by documentary evidence and fail to identify any circumstance in which a lower density slurry “must be produced” in Underwood’s system. *Id.* Nor does Dr. Benson explain why one of ordinary skill in the art looking to produce a lower density slurry would have sought to do so using Underwood’s specific slaking apparatus. *Id.*; *see* Sur-Reply 22–23. Thus, Petitioner’s reply arguments do not persuasively explain why one of ordinary skill in the art would have combined Underwood’s and Pesotini’s disclosures absent hindsight reconstruction of the claimed invention. *See TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1361 (Fed. Cir. 2019) (noting that obviousness determinations may not be “based on conclusory and unsupported expert testimony”); *see also In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (noting that “the Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations”); *Ashland Oil, Inc. v. Delta Resins & Refractories, Inc.*, 776 F.2d 281, 294 (Fed. Cir. 1985) (stating that a lack of objective support for expert opinion “may render the testimony of little probative value in [a patentability] determination”).

Accordingly, for the reasons given above, Petitioner has not shown that a person of ordinary skill in the art would have had reason to combine the teachings of Underwood and Pesotini, as proposed.

b) Slurry Tank

Petitioner contends mixing vessel 12 of Underwood is a slurry tank under Patent Owner’s own definition of that term because it holds watery lime slurry having lime particles and grit particles therein. Pet. 51;

Pet. Reply 6–7. Patent Owner contends mixing vessel 12 is a slaker and not a “slurry tank.” PO Resp. 44–45.

In Underwood’s system, water and lime are introduced into mixing vessel 12 to form a watery lime slurry. Ex. 1011, 1:24–28, 2:38–41, 3:12–18, code (54). For the reasons set forth above in Section II.C.1, mixing vessel 12 is therefore a “lime slaker” and not a “slurry tank.” *See* Ex. 1001, 1:25–26. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that Underwood teaches or suggests a “slurry tank,” as recited in claim 1 of the ’175 patent.

c) Conclusion

For the reasons set forth above, Petitioner has not demonstrated by a preponderance of the evidence that claim 1 of the ’175 patent would have been unpatentable as obvious over the combined disclosures of Underwood and Pesotini.

4. Analysis: Claims 2 and 11

Claims 2 and 11 both depend from independent claim 1. Ex. 1001, 6:28–29, 6:41–42. Petitioner’s arguments with respect to claims 2 and 11 do not resolve the deficiencies noted above with respect to claim 1. Pet. 61–64. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claims 2 and 11 would have been unpatentable as obvious over the combined disclosures of Underwood and Pesotini.

G. Claims 4 and 5 over Underwood, Pesotini, and Westerberg

Petitioner contends the subject matter of claims 4 and 5 would have been obvious over the combined disclosures of Underwood, Pesotini, and Westerberg. Pet. 64–68. Petitioner’s arguments with respect to dependent claims 4 and 5 do not resolve the deficiencies noted above with respect to independent claim 1. Accordingly, Petitioner has not demonstrated by a

preponderance of the evidence that claims 4 and 5 would have been unpatentable as obvious over Underwood, Pesotini, and Westerberg.

H. Claim 7 over Underwood, Pesotini, and Muzik

Claim 7 depends from claim 1 and further requires “a lime slaking device (11, 111) for providing lime slurry to the slurry tank.” Ex. 1001, 6:28–29. Petitioner contends one of ordinary skill in the art would have found it obvious to implement “a separate lime slaking tank, like that described in Muzik, to feed slurry to Underwood’s mixing vessel 12” in order to increase retention time of lime particles in the tanks and facilitate the completion of the slaking reaction. Pet. 68–70. Thus, Petitioner contends the subject matter of claim 7 would have been obvious over the combined disclosures of Underwood, Pesotini, and Muzik. *Id.*

Petitioner’s arguments with respect to claim 7 do not resolve the issues noted above with respect to the reason for implementing Pesotini’s grit classifier in the system of Underwood. Accordingly, Petitioner has not demonstrated by a preponderance of the evidence that claim 7 would have been unpatentable as obvious over Underwood, Pesotini, and Muzik.

In any event, Petitioner’s reasons to implement Muzik’s slaker to feed slurry to Underwood’s mixing vessel 12 are not persuasive, as we are presented with no persuasive explanation as to why one of ordinary skill in the art would have sought to feed slaked lime into slurry tank 12 of Underwood, which already receives inputs of lime and water. Ex. 1011, 3:12–19.

In its sur-reply to Patent Owner’s Motion to Amend addressing proposed substitute claims similar to claim 7, Petitioner contends the Board and Patent Owner misread its proposed combination. Paper 33, 6–7. According to Petitioner, because “there is no mention of adding further

reagents at Underwood’s mixing vessel 12 in the proposed ground, . . . there is no confusion” that reagents would not be added to this vessel in the proposed combination. *Id.* at 7 (asserting that a system that adds reagents twice is “nonsensical”). Petitioner’s argument misconstrues the respective burdens in this proceeding. It is the *Petition* that must persuasively explain both how and why the references would be combined by one of ordinary skill in the art to arrive at the claimed invention. *See TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016); *see also Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“[T]he expedited nature of IPRs bring[s] with it an obligation for petitioners to make their case in their petition to institute.”). Although one could possibly infer from Petitioner’s arguments regarding increased retention time and its citations to Emmett in the *Petition* and the *Reply* that the solid and liquid feeds could be removed from Underwood’s mixing vessel 12, the *Petition* (and *Reply*) never mentions or suggests any modifications to Underwood’s mixing vessel 12. *Pet.* 69–70; *Pet. Reply* 19–20. The only modification proposed in the *Petition* is implementing “an additional lime slaking device in Underwood’s system.” *Pet.* 70. It is not the burden of Patent Owner or the Board to guess as to which elements are retained or eliminated in Petitioner’s proposed combination of references. Accordingly, Petitioner has not carried its burden to demonstrate by a preponderance of the evidence that claim 7 would have been obvious over Underwood, Pesotini, and Muzik.

III. MOTION TO AMEND

“[S]hould the Board find any of the challenged claims to be unpatentable,” Patent Owner’s contingent motion to amend requests substitution of proposed substitute claims 12–22 for original claims 1–11.

MTA 1–2. Because we do not find any challenged claims to be unpatentable, Patent Owner’s contingent motion to amend is dismissed as *moot*.

IV. CONCLUSION

After reviewing the arguments and evidence of record, we determine that Petitioner has not shown by a preponderance of the evidence that claims 1, 2, 4, 5, 7, and 11 are unpatentable.

In summary:

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 7, 11	103	Muzik		1, 2, 7, 11
4, 5	103	Muzik, Westerberg		4, 5
1, 2, 11	103	Underwood, Pesotini		1, 2, 11
4, 5	103	Underwood, Pesotini, Westerberg		4, 5
7	103	Underwood, Pesotini, Muzik		7
Outcome				1, 2, 4, 5, 7, 11

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that no claims of U.S. Patent No. 8,163,175 B2 have been shown to be unpatentable;

FURTHER ORDERED that Patent Owner’s contingent motion to amend (Paper 18) is dismissed as moot; and

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

IPR2019-01563
Patent 8,163,175 B2

FOR PETITIONER:

Matthew Johnson
Marlee Hartenstein
David Cochran
JONES DAY
mwjohnson@jonesday.com
mhartenstein@jonesday.com
dcochran@jonesday.com

FOR PATENT OWNER:

Thomas Fisher
Keri Schaubert
COZEN O'CONNOR
tfisher@cozen.com
kschaubert@cozen.com