

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APTWATER, INC.
Petitioner

v.

THINKVILLAGE-KERFOOT, LLC
Patent Owner

Case IPR2014-00133
Patent 7,537,706 B2

Before GRACE KARAFFA OBERMANN, MICHAEL J. FITZPATRICK,
and SHERIDAN K. SNEDDEN, *Administrative Patent Judges*.

SNEDDEN, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

APTwater, Inc. (“APTwater”) filed a corrected petition to institute an *inter partes* review of claims 1–37 and 39–58 (Paper 6; “Pet.”) of US 7,537,706 B2 (Ex. 1001; “the ’706 patent”). ThinkVillage-Kerfoot, LLC (“ThinkVillage-Kerfoot”) did not file a preliminary response under 37 C.F.R. § 42.107(b).

We have jurisdiction under 35 U.S.C. § 314. The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which states:

THRESHOLD.—The Director may not authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Based on the information in the petition, we conclude that APTwater has established that there is a reasonable likelihood that it will prevail with respect to at least one of the challenged claims. We grant the petition to institute an *inter partes* review as to claims 1–7, 9–31, 33–37 and 39–58, but deny the petition as to claims 8 and 32.

A. *The ’706 Patent (Ex. 1001)*

The ’706 patent discloses a sparging method and apparatus for injecting an air/ozone gaseous mixture in the form of micro-fine bubbles into a subsurface groundwater aquifer or soil region for the purposes of in situ remediation. Ex. 1001, 2:36–54. The system of the ’706 patent uses

microporous diffusers to generate microbubbles of a size to match soil porosity. *Id.* at 3:34–44. The diffuser material may have pores 5–200 microns. *Id.* at 11:7–15.

The disclosed apparatus includes a pump for pumping the oxidizing gas mixture through microporous diffusers into groundwater. *Id.* at 2:65–3:24. The pump intermittently agitates the water in the well, which promotes movement of the bubbles through the porous formation. *Id.*

B. Illustrative Claims

Independent claims 1, 22, 46, and 53 are representative of the challenged claims, and are reproduced below:

1. A method of removal of volatile organic compounds in a soil formation comprises:

injecting air including gaseous ozone into water in the soil formation with gaseous ozone at concentrations to effect removal of volatile organic compounds by the gaseous ozone reacting with the volatile organic compounds and with the air and the ozone injected into the water as fine bubbles with an initial bubble size in a range of about 5 to 200 μm .

22. Apparatus for injection of a gas into aquifer regions for removal of volatile organic compounds by reaction with ozone, comprising:

a gas generator for generating an oxidizing agent comprising ozone for injection of air including ozone into the aquifer;

a microporous diffuser coupled to the gas generator, the microporous diffuser including a body having a porous portion with a pore size in the range of about 5–200 μm ; and

a compressor coupled to the gas generator to provide the gas to the microporous diffuser at an elevated pressure to deliver microbubbles having an initial diameter in a range of

about 5 microns to 200 microns into the aquifer regions.

46. A method comprises: injecting gaseous ozone into a wet soil formation at concentrations to effect removal of volatile organic compounds in the soil formation by delivery of the gaseous ozone in bubbles and with the gaseous ozone reacting with the volatile organic compounds.

53. A method of removal of volatile organic compounds comprises:

injecting air including gaseous ozone into water in a soil formation with gaseous ozone at concentrations to effect removal of volatile organic compounds with the air and the ozone injected into the water as fine bubbles with an initial bubble diameter in a range of about 5 to 200 μm .

Claims 2–21 depend from claim 1, either directly or indirectly.

Claims 23–30 depend from claim 22, either directly or indirectly. Claims 32–37, 39–45 depend from claim 31, either directly or indirectly. Claims 47–52 depend from claim 46, either directly or indirectly. Claims 54–59 directly depend from claim 53.

C. The Prior Art and Supporting Evidence

Petitioner relies on the following prior art:

Marley et al., Groundwater Monitoring & Remediation (GWMR), pp. 137–145, Spring 1992 (“Marley,” Ex. 1007).

Kerfoot, “Injectable Points for Sandy Soil Sparging Systems”, University of Massachusetts 7th Annual Hydrocarbon Contaminated Soils Conference, pp. 1–12, September 1992 (“Kerfoot,” Ex. 1008).

Zappi et al., US Army Corp of Engineers, “A Laboratory Evaluation of the Feasibility of Chemical Oxidation Processes for Treatment of Contaminated Groundwaters,” September 1995 (“Zappi,” Ex. 1009).

SITE - The Superfund Innovative Technology Evaluation Program: Technology Profiles, “Oxygen Microbubble In Situ Bioremediation,” EPA Publication EPA/540/R-92/077, November 1992 (“SITE,” Ex. 1010).

Tamir, US 4,804,478, issued February 14, 1989 (“Tamir,” Ex. 1011).

Last, US 4,141,830, issued February 27, 1979 (“Last,” Ex. 1012).

Pennington, US 5,425,598, issued June 20, 1995 (“Pennington,” Ex. 1013).

Russell et al., “TCE Removal from Contaminated Soil and Ground Water,” *EPA Ground Water Issue*, EPA Publication EPA/540S/S-92/002, January 1992 (“EPA 1992,” Ex. 1014).

Minnich, “Behavior and Determination of Volatile Organic Compounds in Soil,” EPA Publication EPA/600/R-93/140, May 1993 (“EPA 1993,” Ex. 1015).

D. The Asserted Grounds

Petitioner challenges claims 1-37 and 39-58 of the ’706 patent on the following grounds. Pet. 6-8.

Reference[s]	Basis	Claims challenged
Marley	102(b)	46, 47, 50
Marley and Kerfoot	103(a)	46, 47, 50
Marley, Kerfoot, and Zappi	103(a)	46, 47, 50
Marley, Kerfoot, and SITE	103(a)	48, 49, 51
Marley, Kerfoot, SITE, and Zappi	103(a)	1
Marley, Kerfoot, Tamir, and Last	103(a)	2–21

Reference[s]	Basis	Claims challenged
Marley, Kerfoot, and SITE	103(a)	22
Marley, Kerfoot, and Pennington	103(a)	23-30
Marley, Kerfoot, and Pennington	103(a)	31
Marley, Kerfoot, Tamir, and EPA 1993	103(a)	32–37, 39–45
Marley and Kerfoot	103(a)	53
Marley, Kerfoot, and SITE	103(a)	53-58
Marley, Kerfoot, and Tamir	103(a)	54–58

II. ANALYSIS

A. Claim Interpretation

The Board interprets claims using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). “Absent claim language carrying a narrow meaning, the PTO should only limit the claim based on the specification . . . when [it] expressly disclaim[s] the broader definition.” *In re Bigio*, 381 F.3d 1320, 1325 (Fed Cir. 2004). “Although an inventor is indeed free to define the specific terms used to describe his or her invention, this must be done with

reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

APTwater sets forth what it considers to be the ordinary meaning for claim terms: “bubbles,” “injecting gaseous ozone,” and “initial bubble diameter.” Pet. 11–12. APTwater argues that “bubbles” means “a film of liquid enclosing a gas,” “injecting gaseous ozone” means “introducing a gas which comprises ozone,” and “initial bubble diameter” means “diameter of a bubble measured immediately upon its creation.” Pet. 12. Those proposed constructions are reasonable at this stage of the proceeding under the broadest reasonable construction standard. We, therefore, adopt them for the purposes of this decision.

B. Asserted Grounds of Unpatentability

1. Anticipation of Claims 46, 47, and 50 by Marley

a. Claims 46 and 47

Claim 47 provides as follows:

47. The method of claim 46 further comprising
injecting the gaseous ozone with air; and
wherein injecting gaseous ozone with air occurs in
ground water of a subsurface aquifer.

In support of its assertion that Marley anticipates claims 46 and 47, APTwater sets forth the following teachings of Marley, and provides a detailed claim chart explaining how each claim limitation is disclosed in Marley. Pet. 13–15.

Marley discloses an air-sparging system and approach to soil remediation. Ex. 1007, Abstract and Figures 1 and 2. The system uses sparging (injection) wells to inject a gas such as air into a subsurface

environment below or within the areas of contamination. *Id.* at 138, col. 1. Volatile organic compounds dissolved in ground water and sorbed onto, or trapped in, the soil are removed as they travel with the injected gas through the vadose subsurface zone to a vapor extraction well where contaminant vapors are treated using a vapor extraction, off-gas treatment system. *Id.*

Marley discloses that design parameters for the air-sparging system include contaminant type, gas injection pressures and flow rates, site geology, bubble size, injection interval, and equipment specifications. *Id.* at Abstract. The choice of sparging gas is dependent on contaminant type and may include a combination of air, ozone, and/or hydrogen peroxide. *Id.* at 139, col. 1. With regard to bubble size, Marley discloses that a large number of small bubbles will provide better mass transfer characteristics for the removal of volatile organic compounds as compared to a smaller number of large bubbles. *Id.* at 139, col. 1. Air diffusers at the sparging point are used to inject small bubbles into a coarse grain formation. *Id.*

Upon review of APTwater's analysis and the evidence of record, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that Marley anticipates claims 46 and 47 of the '706 patent.

b. Claim 50

Claim 50 provides as follows:

50. The method of claim 46 further comprises: injecting the gaseous ozone through microporous materials to provide the bubbles.

APTwater relies on Marley's disclosure that air diffusers may be used at the sparging point in order to inject small bubbles into a course-grained

formation to reach the additional element recited by claim 50. Pet. 15 (citing Ex. 1007, 139). APTwater, however, does not explain adequately how a person of ordinary skill in the art would equate “small bubbles” with the use of “microporous materials.”

A finding of anticipation by inherency requires more than probabilities or possibilities. *Motorola Mobility LLC v. Int’l Trade Comm’n*, 737 F.3d 1345, 1350 (Fed. Cir. 2013). Here, APTwater identifies no express statement in the cited portion of Marley that microporous materials were used. Based on the information presented, we are not persuaded that a skilled artisan would equate small bubbles with microbubbles and, thus, understand Marley to disclose the use of microporous materials to produce bubbles. On this record, Petitioner comes forward with evidence insufficient to support an inference that Marley anticipates claim 50.

2. Obviousness of Claims 46, 47, and 50 Over Marley and Kerfoot

a. *Claims 46 and 47*

Because anticipation is the epitome of obviousness, a disclosure that anticipates under 35 U.S.C. § 102 also renders the claim unpatentable under 35 U.S.C. § 103. See *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982); *In re Meyer*, 599 F.2d 1026, 1031 (CCPA 1979); *In re Pearson*, 494 F.2d 1399, 1402 (CCPA 1974).. Thus, for the reasons set forth above, we hold that APTwater has demonstrated a reasonable likelihood that claims 46 and 47 are rendered obvious by Marley, alone or in combination with Kerfoot.

b. Claim 50

Kerfoot discloses designs of sparging systems, and specifically the importance of bubble zone diameter, bubbler depth, and use of microporous cylinders in creating an effective bubbling zone. Ex. 1008, 1-2. Kerfoot discloses that “[a]ir injections through microporous cylinders” create “fine bubbles giving more uniform bubble distribution than injections through slitted PVC well screen.” *Id.* at 2. Kerfoot further notes that “[i]t is preferable to match bubble size to the size of the soil particle interstitial space,” which can be accomplished “by using porous plastic cylinders as bubblers instead of slotted well screens.” *Id.* at 4. Kerfoot discloses that porous plastic cylinders with a 50 micron pore size create bubbles that are 0.05 mm (50 micron) in diameter. *Id.*

In support of its assertion that the combination of Marley and Kerfoot renders claim 50 obvious, APTwater directs us to the foregoing teachings of Marley and Kerfoot and provides a detailed claim chart explaining how each claim limitation is disclosed in the combination of references. Pet. 13–16. APTwater also contends that it would have been obvious to use Kerfoot’s microporous diffuser for generating bubbles in the size range recited in the claims in the apparatus of Marley because Marley teaches the importance of bubble geometry on removal of the contaminants and that a large number of small bubbles provide desirable mass transfer characteristics. *Id.* at 15 (citing Ex. 1007, 139).

Upon review of APTwater’s analysis and the evidence of record, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 50 of the ’706 patent

would have been obvious in view of Marley and Kerfoot.

3. Obviousness of Claims 48, 49, and 51 Over Marley, Kerfoot, and SITE

a. Claims 48 and 49

Claims 48 and 49 provide as follows:

48. The method of claim 46 wherein the bubbles are fine bubbles with an initial bubble size in a range of about 5 to 200 μm .

49. The method of claim 48 wherein the fine bubbles are sized in accordance with a porosity characteristic of the soil formation.

As discussed above in relation to claim 46, Kerfoot discloses designs of sparging systems having a microporous cylinder that creates bubbles 0.05 mm (50 micron) in diameter. Ex. 1008, 4. SITE discloses the use of a microbubble dispersion in the range of 45 ± 40 microns. Ex. 1010, 282. APTwater relies on these teachings of Kerfoot and SITE for the additional limitation recited by claim 48. Pet. 18.

As to this additional limitation recited by claim 49, APTwater relies on the disclosure in Kerfoot that it is preferable to match bubble size to the size of the soil particle interstitial space. Pet. 18 (citing Ex. 1008, 4).

Upon review of APTwater's analysis and evidence of record, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claims 48 and 49 of the '706 patent would have been obvious in view of Marley, Kerfoot, and SITE.

b. Claim 51

Claim 51 provides as follows:

51. The method of claim 46 further comprises: injecting the ozone through a slotted well screen to provide the bubbles.

Kerfoot discloses slotted well screens as an alternative to porous plastic cylinders that produce microporous bubbles. Ex. 1008, 4. Specifically, Kerfoot discloses that extended slots of a 0.010 (10 slot) PVC monitoring well screen presents an opening of 0.010 inch by 2.0 inches for bubble production. *Id.* APTwater relies on this teaching of Kerfoot to reach the elements of claim 51. Pet. 19.

Upon review of APTwater's analysis and evidence of record, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 51 of the '706 patent would have been obvious in view of Marley, Kerfoot, and SITE.

4. Obviousness of Claim 1 Over Marley, Kerfoot, SITE, and Zappi

In support of its assertion that claim 1 would have been obvious, APTwater provides a detailed claim chart explaining how each claim limitation is disclosed in the prior art. Pet. 19–24. As in previous grounds discussed above, Marley is relied upon for its disclosure of an air-sparging system for the extraction of volatile organic compounds dissolved in ground water and sorbed onto, or trapped in, soil travel. *Id.* (citing Ex. 1007, Abstract, Figure 1, 139-140).

APTwater again relies on Kerfoot for its disclosure of using microporous diffusers for the purpose of matching air bubble size to the size

of solid particle interstitial space (pore size). Pet. 20. APTwater contends that it would have been obvious to use Kerfoot's microporous diffuser for generating bubbles in the size range of 50 microns in the apparatus of Marley because Marley teaches the importance of bubble geometry on removal of the contaminants and that a large number of small bubbles provides desirable mass transfer characteristics. *Id.* APTwater further notes that the use of microbubble dispersion in the range of 45 ± 40 microns was known. *Id.* at 21, 23-24 (citing Ex. 1010, 282).

APTwater relies on Zappi as evidence that it was known to use ozonated air for effective removal of volatile organic compounds via air sparging in soil and ground water remediation processes. Pet. 20–21, 23 (citing Ex. 1009, 23). APTwater contends that a person of ordinary skill in the art would have had a reasonable expectation of success for using air/ozone microbubbles generated by a microporous diffuser as taught by Kerfoot in the apparatus of Marley. *Id.*

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 1 of the '706 patent would have been obvious in view of Marley, Kerfoot, SITE, and Zappi.

5. Obviousness of Claims 2–21 Over Marley, Kerfoot, Pennington, Tamir, and Last

Claims 2–21 depend directly or indirectly from claim 1. In support of its assertion that claims 2-21 would have been obvious, APTwater provides discussion and a detailed claim chart explaining how each claim limitation is

disclosed in the prior art. Pet. 24–34. APTwater contends that the claims represent an arrangement of known elements that do no more than yield predictable results. *Id.* at 24.

As in previous grounds discussed above, Marley is relied upon for its disclosure of an air-sparging system for the extraction of volatile organic compounds dissolved in ground water and sorbed onto, or trapped in, soil travel. *Id.* (citing Ex. 1007 at abstract, Figure 1 and 139-140).

APTwater again relies on Kerfoot for the disclosure of using microporous diffusers for the purpose of matching air bubble size to the size of solid particle interstitial space (pore size). Pet. 20. APTwater contends that it would have been obvious to use Kerfoot’s microporous diffuser for generating bubbles in the size range of 50 microns in the apparatus of Marley because Marley teaches the importance of bubble geometry on removal of the contaminants and that a large number of small bubbles provide desirable mass transfer characteristics. *Id.*

APTwater relies on Tamir and Last as evidence that a mixture of air and ozone is inherent with the use of an ozone generator. Pet. 28-29; *see* Ex. 1011, 3:7–10; Ex. 1012, 1:20–22.

APTwater relies on Pennington as evidence that it was known to use sand as a packing material in sparge wells. Pet. 30-31 (citing Ex. 1013, 3:14–16).

Upon review of APTwater’s analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claims 2–7 and 9–21 of the ’706 patent would have been obvious in view of cited prior art.

APTwater, however, has not identified sufficient evidence to establish that the cited prior art, alone or in combination, renders obvious the subject matter of claim 8. We note that APTwater's claim chart incorrectly numbers claims 9–11 as claims 8–10. Pet. 29-30. The result is that APTwater does not address claim 8's requirement that "volatile organic compounds in the soil formation are decomposed by ozone inter-action with double bonded carbon atoms of the volatile organic compounds."

6. Obviousness of Claim 22 over Marley, Kerfoot, and SITE

In support of its assertion that claim 22 would have been obvious, APTwater provides a detailed claim chart explaining how each claim limitation is disclosed in the prior art. Pet. 34-37. As in previous grounds discussed above, Marley is relied upon for its disclosure of an air-sparging system for the extraction of volatile organic compounds dissolved in ground water and sorbed onto, or trapped in, soil travel. *Id.* (citing Ex. 1007, Abstract, Figure 1, and 139-140). Marley is further relied upon for its disclosure of an air-sparging system having an ozone generator and compressor. *Id.* at 35, 37 (citing Ex. 1007, 139-140).

As in previous grounds discussed above, APTwater relies on Kerfoot for the disclosure of using microporous diffusers to create microbubbles with the range of 5-200 μm . *Id.* at 34-35. APTwater further notes that the use of a microbubble dispersion in the range of 45 ± 40 microns was known. *Id.* at 36 (citing Ex. 1010, 282). APTwater contends that claim 22 represents an arrangement of known elements that does no more than yield predictable results. *Id.* at 35.

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 22 of the '706 patent would have been obvious in view of Marley, Kerfoot, and SITE.

7. Obviousness of Claims 23–30 Over Marley, Kerfoot, and Pennington

Claims 23–30 depend directly or indirectly from claim 22. APTwater again contends that the claims represent an arrangement of known elements that do no more than yield predictable results. *Id.* at 38.

In support of its assertion that claims 23–30 would have been obvious, APTwater provides discussion and detailed claim chart explaining how each element of dependent claims 23–30 is disclosed in the prior art. Pet. 38–41. APTwater relies upon Marley and Kerfoot for the same teachings as discussed above with regard to claim 22. *Id.*

APTwater relies upon Pennington for its disclosure of a system for sparging ground water using a borehole and tubular well casings having perforations to allow fluid flow into or out of the well casing. *Id.*; *see* Ex. 1013, 3:1–12. Pennington is further relied upon for disclosing the use of sand or other permeable packing material in the well casing. *Id.* (citing Ex. 1013, 3:14–16).

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claims 23–30 of the '706 patent would have been obvious in view of cited prior art.

8. Obviousness of Claims 31 Over Marley, Kerfoot, and Pennington

Based on the information at this stage of the proceeding, we conclude that the scope of claim 31 is substantially similar to the scope of claims 1 and 12 for which we have determined that APTwater has demonstrated a reasonable likelihood that it would prevail in its challenge. Regarding claim 31, APTwater relies upon Marley, Kerfoot, and Pennington for the same teachings as discussed above with regard to claims 1 and 12. Pet. 19–23, 30–31; *cf. id.* at 41–45. APTwater contends that a person of ordinary skill in the art would have had a reasonable expectation of success to arrive at the method of claim 31 in view of the prior art. *Id.*

Thus, for similar reasons discussed above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 31 of the '706 patent would have been obvious in view of cited prior art.

9. Obviousness of Claims 32–37 and 39–45 Over Marley, Kerfoot, Pennington, and Tamir

Claims 32–37 and 39–45 depend directly or indirectly from claim 31. APTwater provides discussion and detailed claim chart explaining how the elements of each claim are disclosed in the prior art. Pet. 45-50. Marley, Kerfoot, Pennington, and Tamir are relied upon for the same teachings as discussed above with regard to claims 1–21. *Id.*; *cf. id.* at 19–34.

With regard to claims 40–42, APTwater relies on EPA 1993 as evidence that chlorinated hydrocarbons such as dichloroethene, trichloroethene, and tetrachloroethene are volatile organic compounds found in soil. *Id.* at 48 (citing Ex. 1015, 24).

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claims 33–37 and 39–45 of the '706 patent would have been obvious in view of cited prior art.

APTwater, however, has not identified sufficient evidence to establish that the cited prior art, alone or in combination, renders obvious the subject matter of claim 32. We note that APTwater's claim chart does not include claim 32. Pet. 46. The result is that APTwater does not address claim 32's requirements of “determining a porosity characteristic of a site containing the volatile organic compounds” and “wherein the bubbles having an initial bubble diameter in accordance with the determined porosity characteristic of the site and with the ozone reacting with the volatile organic compounds.”

10. Obviousness of Claim 53 Over Marley and Kerfoot

Based on the information presented at this stage of the proceeding, we conclude that the scope of claim 53 is substantially similar to the scope of claim 46 for which we have determined that APTwater has demonstrated a reasonable likelihood that it would prevail in its challenge. Claim 53 differs from claim 46 in that claim 53 specifies that the air/ozone mixture is injected as fine bubbles with an initial bubble diameter in the range of about 5 to 200 μm .

Regarding claim 53, APTwater relies upon Marley and Kerfoot for the same teachings as discussed above with regard to claim 46, which include the teaching of microbubbles within the size range recited in claim 53. Pet. 52–54; *cf. id.* at 15–16. APTwater contends that a person of ordinary skill in

the art would have had a reasonable expectation of success to arrive at the method of claim 53 in view of the prior art. *Id.*

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claim 53 of the '706 patent would have been obvious in view of Marley and Kerfoot.

11. Obviousness of Claim 54–58 Over Marley, Kerfoot, and Tamir

Claims 54-58 depend directly from claim 53. APTwater provides discussion and a detailed claim chart explaining how the additional elements recited in each of these claims are disclosed in the prior art. Pet. 54–56. APTwater again contends that the claims represent an arrangement of known elements that do no more than yield predictable results. *Id.* at 54.

Upon review of APTwater's analysis and the evidence of record summarized above, we determine that APTwater has demonstrated that there is a reasonable likelihood that it would prevail in showing that claims 54–58 of the '706 patent would have been obvious in view of Marley and Kerfoot.

12. Obviousness of Claims 46, 47, and 50 Over Marley and Zappi

APTwater does not distinguish adequately between this ground and the grounds on which we have already granted the Petition to institute *inter partes* review. Accordingly, this ground is denied as redundant. 37 C.F.R. § 42.108(a).

III. CONCLUSION

We institute an *inter partes* review of claims 1–7, 9–31, 33–37, and 39–58. We decline to institute an *inter partes* review on claims 8 and 32 for

the reasons stated above.

IV. ORDER

For the reasons given, it is

ORDERED that the Petition is granted as to claims 1–7, 9–31, 33–37, and 39–58 of the ‘706 patent with respect to the following alleged grounds:

- (i) Claims 46 and 47 under 35 U.S.C. § 102(b) Marley;
- (ii) Claims 46, 47, and 50 under 35 U.S.C. § 103(a) over Marley and Kerfoot;
- (iii) Claims 48, 49, and 51 under 35 U.S.C. § 103(a) over Marley, Kerfoot, and SITE;
- (iv) Claim 1 under 35 U.S.C. § 103(a) over Marley, Kerfoot, SITE, and Zappi;
- (v) Claims 2–7 and 9–21 under 35 U.S.C. § 103(a) over Marley, Kerfoot, Pennington, Tamir, and Last;
- (vi) Claim 22 under 35 U.S.C. § 103(a) over Marley, Kerfoot, and SITE;
- (vii) Claims 23–30 under 35 U.S.C. § 103(a) over Marley, Kerfoot, and Pennington;
- (viii) Claim 31 under 35 U.S.C. § 103(a) over Marley, Kerfoot, and Pennington;
- (ix) Claims 33–37 and 39–45 under 35 U.S.C. § 103(a) over Marley, Kerfoot, Tamir, and EPA 1993;
- (x) Claim 53 under 35 U.S.C. § 103(a) over Marley and Kerfoot; and
- (xi) Claim 53–58 under 35 U.S.C. § 103(a) Marley, Kerfoot, and

Tamir.

FURTHER ORDERED that the trial is limited to these grounds, and no other grounds are authorized.

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the '706 patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

PETITIONER:

Judy M. Mohr
Susan L. Harlocker
MCDERMOTT WILL & EMERY LLP
jmohr@mwe.com
sharlocker@mwe.com

PATENT OWNER:

A. Justin Poplin
Curtis A. Vock
LATHROP & GAGE LLP
JPoplin@LathropGage.com
CVock@LathropGage.com