

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

FLUID ENERGY GROUP LTD.,

Petitioner,

v.

GREEN PRODUCTS AND TECHNOLOGIES, LLC,

Patent Owner.

IPR2021-00357

Patent 7,938,912 B1

Before GRACE KARAFFA OBERMANN, CHRISTOPHER L. CRUMBLEY,
and KRISTINA M. KALAN, *Administrative Patent Judges*.

OBERMANN, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining No Challenged Claims Unpatentable

35 U.S.C. § 318(a)

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review of claims 1–8 of U.S. Patent No. 7,938,912 B1 (Ex. 1001, “the ’912 Patent”). We have jurisdiction under 35 U.S.C. § 6 and enter this Decision pursuant to 35 U.S.C. § 318(a). For the reasons that follow, Petitioner¹ does not establish by a preponderance of the evidence that any challenged claim is unpatentable.

A. Procedural History

Petitioner filed a Petition requesting review of the challenged claims. Paper 2 (“Pet.”). Patent Owner² filed a Preliminary Response to the Petition. Paper 10. Based on the preliminary record, we instituted an *inter partes* review of all challenged claims based on all grounds of unpatentability asserted in the Petition as set forth in the following table. Paper 11 (“Dec.”).

Claims Challenged	35 U.S.C. §	References
1–4, 7, 8	103(a) ³	Sargent, ⁴ Sanders ⁵
5, 6	103(a)	Sargent, Sanders, Martin ⁶

¹ “Petitioner” refers to Fluid Energy Group Ltd. and Fluid USA, Inc., is identified as a real party-in-interest. *See* Paper 2, 1 (identification of Petitioner’s real parties-in-interest); Paper 24, 1 (same).

² “Patent Owner” refers to Green Products and Technologies, LLC. *See* Paper 5, 1 (identification of Patent Owner’s real party-in-interest).

³ 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 ’912 patent application has an effective filing date prior to March 16, 2013, the pre-AIA version of § 103 applies.

⁴ US 5,672,279, issued Sept. 30, 1997 (Ex. 1006).

⁵ US 8,347,973 B2, issued Jan. 8, 2013 (Ex. 1007).

⁶ US 6,497,769 B1, issued Dec. 24, 2002 (Ex. 1012).

Claims Challenged	35 U.S.C. §	References
1, 5, 6	103(a)	Sargent, Rodine MSDS, ⁷ and Martin
1–4, 6–8	103(a)	Netherton, ⁸ McCormick, ⁹ Mancillas ¹⁰

Pet. 6. Petitioner also relies on the Declaration of Mr. Richard Hutchins (Ex. 1003) and the Henkel Declaration (Ex. 1021), which was executed by Ms. Martina Werner on behalf of Henkel Corporation. Patent Owner relies on the Declaration of Mr. Robert Schaaf. Ex. 2001.

After institution of trial, Patent Owner filed a Response (Paper 27, “Resp.”), Petitioner filed a Reply (Paper 39, “Reply”), and Patent Owner filed a Sur-reply (Paper 41, “Sur-reply”). The parties jointly waived the final hearing set for March 25, 2022. Ex. 3002.

B. Related Matters

The parties identify no related matters. Paper 5; Paper 24.

C. The '912 Patent (Ex. 1001)

The '912 patent is titled “Composition for Removing Cementitious Material from a Surface and Associated Methods.” Ex. 1001, code (54). “The composition includes HCl, urea, complex substituted keto-amine-hydrochloride, an alcohol, an ethoxylate, and a ketone.” *Id.* at code (56).

⁷ Material Safety Data Sheet, Rev. 1:0307, dated Jan. 24, 2007 (Ex. 1008).

⁸ US 7,534,754 B2, issued May 19, 2009 (Ex. 1009).

⁹ US 7,981,314 B2, issued June 19, 2011 (Ex. 1010).

¹⁰ CA 2,049,365, published Feb. 18, 1992 (Ex. 1011).

According to the written description of the invention provided in the '912 patent, “removal of water-insoluble cementitious and lime materials from surfaces is known to be a difficult process.” *Id.* at 1:13–14. Known compositions may cause “corrosion and flash rusting to metal and metal alloy surfaces” and harm the environment. *Id.* at 1:18–19, 1:27–29. For example, chromium is an environmentally harmful metal that “is often used as a lustrous coating on bumpers” and other parts of “vehicles such as concrete trucks.” *Id.* at 1:31–37. Because “construction equipment is typically washed outdoors, the resulting process water usually drains directly into the ground,” which may result in environmentally hazardous compositions entering the groundwater. *Id.* at 1:37–42. The written description provided in the '912 patent further identifies a need for “a composition and method of use that are effective at *removing* cementitious materials *from* surfaces without causing corrosion or rusting” or releasing “harmful substances” into the environment. *Id.* at 1:43–47 (emphasis added); *compare id.* at (57) (Abstract) (“A composition is provided for use in cleaning a surface of a cementitious material.”).

The detailed description of the invention focuses on “a preferred embodiment” that incorporates “HCl, urea, complex substituted keto-amine-hydrochloride, at least one alcohol, an ethoxylate, and a ketone.” *Id.* at 2:17–19. The '912 patent does not identify the purpose of any individual component in the composition. *See generally* Ex. 1001. The '912 patent, however, describes preferred weight percentage concentrations for each component (*id.* at 2:17–37, 2:42–3:12) and a range of “dilution levels” that may be useful “for different applications” (*id.* at 2:38–41). The '912 patent describes examples of different applications, including concrete removal

from construction equipment (*id.* at 1:34–37, 2:44–45), and “efflorescence” removal “on cementitious materials” such as concrete (*id.* at 2:59–51). Of critical importance to our analysis, however, independent claim 1 expressly requires “applying the composition to a surface to release a cementitious material therefrom.” *Id.* at 3:28–29.

D. Challenged Claims

Petitioner challenges claims 1–8 of the ’912 patent. Pet. 6. Claim 1, reproduced below, is the sole independent claim and illustrates the subject matter of the invention.

1. A method for cleaning a surface of a cementitious material comprising:
 - providing a composition comprising HCl, urea, complex substituted keto-amine-hydrochloride, an alcohol, an ethoxylate, and a ketone;
 - applying the composition to a surface to release a cementitious material therefrom; and
 - removing the composition and released cementitious material from the surface.

Ex. 1001, 3:23–4:2. The other challenged claims depend from claim 1, and add, respectively, limitations that specify species of chemical components in the composition (claims 2–4), weight percentage concentrations of components in the composition (claim 5), a range of dilution levels (claim 6), an abrading step (claim 7), and a soaking step (claim 8).

Id. at 4:3–26. For reasons that follow, we determine Petitioner has not shown by a preponderance of the evidence that any of claims 1–8 is unpatentable.

II. ANALYSIS

Our analysis is centered on explaining why we determine that Petitioner has not met its burden of proving the unpatentability of claim 1 based on any ground asserted in the Petition. Petitioner advances no information, in connection with any other challenged claim, that cures the deficiencies that we identify below as to claim 1. *See* Pet. 23–36, 39–46, 51–56. Accordingly, the challenges asserted in the Petition rise and fall with the sufficiency of Petitioner’s showing made with respect to claim 1, and our analysis of claim 1 applies with equal force to each challenged claim.

A. Principles of Law

To prevail in this proceeding, Petitioner must demonstrate by a preponderance of the evidence that the challenged claims are unpatentable. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d) (2019). “In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016); *see also* 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”). That burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015); *see also In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375–78 (Fed. Cir. 2016) (discussing the burden of proof in *inter partes* review proceedings).

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “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.” 35 U.S.C. § 103(a) (2006); *see also 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 the scope and content of the prior art, any differences between the claimed subject matter and the prior art, the level of ordinary skill in the art, and objective evidence of nonobviousness.¹¹

Graham v. John Deere Co., 383 U.S. 1, 17–18 (1966). “An obviousness determination requires finding both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *CRFD Research, Inc. v. Matal*, 876 F.3d 1330, 1340 (Fed. Cir. 2017) (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016)).

We analyze Petitioner’s challenges according to the above-stated principles.

B. Person of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham*, 383 U.S. at 17–18; *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)). In Petitioner’s view, an ordinarily skilled artisan “would have had a good working knowledge of chemistry for industrial uses” gained through “at least a Bachelor’s degree, but also through a Master’s degree, in chemistry, chemical engineering, or a comparable field, as well as some experience in the field.” Pet. 11 (citing Ex. 1003 ¶¶ 55–59). Patent Owner

¹¹ Patent Owner does expressly argue that objective evidence of nonobviousness undercuts Petitioner’s challenges in this case.

counters Petitioner's view, arguing that "academic knowledge of chemistry was less important than hands-on experience." Resp. 2 (citing Ex. 2010 ¶ 16). According to Patent Owner, "A person having ordinary skill in the art of methods for cleaning surfaces did not necessarily have much, if any, formal education in Chemistry or Chemical Engineering, but did have extensive hands-on experience using cleaning compositions." *Id.*

Patent Owner contends that Petitioner's definition is unreasonable because "[t]he ordinary level of skill is much lower." Resp. 4. In Patent Owner's further view, Petitioner's definition "approaches an idealized, ivory tower intellectual with encyclopedic knowledge and unlimited access to information." *Id.* That argument, however, is not grounded in an accurate understanding of the law. Although an ordinarily skilled artisan is not one "skilled in remote arts" or a "genius[] in the art at hand," the "hypothetical person . . . is presumed to be aware of all the pertinent prior art." *See Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 697 (Fed. Cir. 1983); *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985); MPEP § 2141(II)(C) (9th ed. rev. 10.2019 June 2020).

Accordingly, we agree with Petitioner that Patent Owner's argument, that "[p]roviding a composition does not require understanding the nuances of each chemical contained therein," is flawed. Sur-reply 1. To determine whether a claim is unpatentable for obviousness to one of ordinary skill in the pertinent art, we consider "the differences between the subject matter sought to be patented and the prior art." 35 U.S.C. § 103(a) (2006); *see also KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). Here, Patent Owner acknowledges that "[t]he primary difference between known methods and the claimed invention of the '912 Patent is a novel composition that solved

problems associated with the previously used prior art compositions.” Sur-reply 11. Further, the specification informs that “[o]ne of skill in the art will recognize that these compositions are not intended to be limiting, and variations in ingredients and proportions can be made without departing from the spirit of the invention.” Ex. 1001, 3:13–16. Accordingly, Patent Owner’s view that an ordinarily skilled artisan would only need to rely on pre-formulated cleaning compositions and reported safety information, without “their own chemical knowledge,” is inconsistent with the disclosure of the ’912 patent. Sur-reply 2–3.

An ordinarily skilled artisan, as required by the ’912 patent, would understand the nuances of the chemicals required by the terms of the claims. Therefore, we find that Petitioner’s definition, on this record, is representative of the level of ordinary skill in the art and consistent with the disclosures of the ’912 patent. *See* Ex. 1001, 3:13–16.

Based on their respective statements of qualifications and *curricula vitae*, for purposes of this Decision, we find both Mr. Hutchins and Mr. Schaaf are qualified to opine about the level of ordinary skill in the art at the time of the invention. Ex. 1003 ¶¶ 4–15 (Mr. Hutchins’s qualifications); Ex. 1004 (Mr. Hutchins’s *curriculum vitae*); Ex. 2001, 4–5 (Mr. Schaaf’s qualifications); Ex. 2002 (Mr. Schaaf’s *curriculum vitae*).

C. Claim Construction

The Board interprets claims using the same standard applied 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) (2020). Under that standard,

we interpret the claim language as it would be understood by one of ordinary skill in the art in light of the specification. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning ‘is the meaning that the term would have to a person of ordinary skill in the art in question.’” (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005))).

“In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317.

Petitioner proposes constructions for six claim terms. Pet. 11–18; Reply 5–12. Patent Owner opposes Petitioner’s proposed constructions. Resp. 4–17; Sur-reply 4–8. In the next two subsections, we focus exclusively on the two issues of claim construction necessary to resolve Petitioner’s patentability challenges. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (construing only terms in controversy and only to the extent necessary to resolve the controversy).

1. “cleaning a surface of a cementitious material”

The preamble of claim 1 reads, “A method for cleaning a surface of a cementitious material.” Ex. 1001, 3:23–24. Those words, at first blush, seem to indicate that what is being cleaned is the surface of a cementitious material. *Id.* However, that meaning is inconsistent with the body of the

claim, which unambiguously indicates that “a cementitious material” is released and removed *from* “a surface.” *Id.* at 3:28–4:2.

The summary and detailed description of the invention provided in the disclosure of the ’912 patent plainly identify the object of the claimed invention as “removing cementitious materials *from* surfaces.” *Id.* at 1:44–47 (emphasis added); *see id.* at 1:58–61, 2:42–45 (same). The detailed description, moreover, consistently describes the composition used in the claimed method as a “concrete removing agent.” *Id.* at 2:52, 3:1, 3:6. That comports with the title of the ’912 patent, that is, “Composition for Removing Cementitious Material *From* a Surface and Associated Methods.” *Id.* at code (54) (emphasis added).

Against that backdrop, we address the first question before us, namely, whether the preamble limits the scope of claim 1. Petitioner argues that “[t]he preamble is not limiting” because the remainder of the claim does not rely on the preamble for antecedent basis and, in addition, the preamble does not provide additional structure or steps “necessary to give life, meaning and vitality to the claim.” Pet. 11–12 (citing *Arctic Cat Inc. v. GEP Power Prods., Inc.*, 919 F.3d 1320, 1328, 1329 (Fed. Cir. 2019)); Reply 5–6.

Patent Owner responds that “[t]he preamble breathes life and meaning into the claim by distinguishing its method from many other potential uses of compositions comprising HCl and urea.” Resp. 4–5; Sur-reply 4. Specifically, Patent Owner argues that the ’912 patent expressly relates to “compositions and methods for cleaning surfaces of cementitious materials” (or “removing” a “released cementitious material from a surface” that is distinct from the cementitious material itself (Ex. 1001, 4:1–2)) and, furthermore, that “[w]ithout the preamble, the steps of the method could be

misconstrued to apply to other processes that are totally unrelated to cleaning, such as treating operations or neutralization processes.” Resp. 5 (quoting Ex. 1001, 1:8–11); *see* Sur-reply 4.

Whether a preamble recites limitations, as opposed to mere statements of intended purpose or use, “can be resolved only on review of the entirety of the [record] to gain an understanding of what the inventors actually invented and intended to encompass by the claim” as drafted, taking care to avoid importing “‘extraneous’ limitations from the specification.” MPEP § 2111.02 (9th ed. rev. 10.2019 June 2020) (quoting *Corning Glass Works v. Sumitomo Elec. U.S.A., Inc.*, 868 F.2d 1251, 1257 (Fed. Cir. 1989)).

Particularly, the MPEP explains that:

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention’s limitations, then the preamble is not considered a limitation and is of no significance to claim construction. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999).

Based on the information presented on this record, we determine that nothing in the body of claim 1 supports a determination that the “cleaning” clause of the preamble represents an additional method step of the claimed invention. Ex. 1001, 3:23–24. To the contrary, the body of the claim fully and completely sets forth all of the required method steps of the invention, as well as the components of the required composition. *See id.* at 3:25–4:2. Specifically, independent claim 1 comprises three method-step limitations, namely, “providing a composition,” “applying the composition to a surface,” and “removing the composition . . . from the surface.” *Id.* Those limitations,

taken together, indicate that the preamble's mention of "cleaning" is a non-limiting intended use of the composition specified in the body of the claim.

2. *"applying the composition to a surface to release a cementitious material therefrom"*

Independent claim 1 contains a step of "applying the composition to a surface to release a cementitious material therefrom." Ex. 1001, 3:28–29. Resolving the parties' dispute in this case requires us to consider whether Petitioner is correct that claim 1 encompasses applying the composition to a surface *of a cementitious material* to release a *portion of that* cementitious material therefrom. Pet. 15–16. Patent Owner disagrees with that view, arguing that the composition must be applied to the surface of a material that is not itself the released cementitious material. Resp. 6. We resolve that dispute in favor of Patent Owner for the following reasons.

The plain terms of claim 1 support applying the composition to "a surface" that is a structural component separate and distinct from the "released cementitious material." Ex. 1001, 3:28–4:2. Petitioner's construction would collapse two distinctly claimed structures (i.e., "a surface" and "a cementitious material") into a single structure. *Id.* The plain language of claim 1, however, describes "applying the composition to a surface to release a cementitious material *therefrom*" and "removing the composition and released cementitious material *from the surface*." *Id.* (emphasis added). Where claim 1 uses different phrases with separate antecedent bases, we determine that "a surface" is not the same structure as "a cementitious material," which in the final method step of claim 1 is "released . . . from the surface." *Id.*

Dependent claim 8 specifies, “The method recited in claim 1, further comprising, . . . leaving the composition on the surface for a period of time to permit the composition to soak into the cementitious material on the surface to assist in releasing the cementitious material from the surface.” Ex. 1001, 4:22–26. Petitioner argues that, in view of dependent claim 8, “sufficient cementitious material is required to remove portions therefrom under claim 1, so that claim 8 removes additional and different material than claim 1.” Pet. 16. Petitioner further argues that an ordinarily skilled artisan would understand claim 1 to mean “that a surface of a cementitious material is being cleaned and would release some cementitious material, but not all.” *Id.* at 16–17. Patent Owner counter argues that “the surface must be distinct from (as opposed to being made of) the cementitious material” itself and that “[a]ny amount of cementitious material that can be removed according to Claim 8 must, by definition, be removable by Claim 1.” Resp. 6, 14.

Petitioner also argues, unpersuasively, that independent claim 1 and dependent claim 8 release different portions of the cementitious material, because dependent claim 8 is directed to assisting “in releasing the cementitious material from the surface,” but does not address adequately, if at all, independent claim 1’s antecedent basis of the “releasing” action. Reply 11–12; Pet. 15–17 (“Claim 1 must result in release of cementitious material independent of claim 8.”); Ex. 1001, 4:22–26. Dependent claim 8 inherits, through its dependence from claim 1, the same, independent antecedent bases of “a surface” and “a cementitious material.” Ex. 1001, 3:28–29. Accordingly, we do not read dependent claim 8 as requiring the removal of a different portion of the cementitious material than in claim 1 and, moreover, neither claim compels a reading of claim 1 that collapses two

specified structural elements, namely, “a surface” and “a cementitious material,” into a single structural element of the claimed invention. *Id.*

Petitioner’s suggestion that the claims support the application of the composition to a surface of a cementitious material, to remove a released “efflorescence,” is developed inadequately on this record and, in addition, runs counter to the plain words that appear in claim 1. Pet. 16; *see* Reply 14 (Petitioner’s additional information on point); *see also* Ex. 1003 ¶ 103 (Mr. Hutchins’s conclusory and undeveloped opinions on point). Although the ’912 patent discloses an embodiment in which “[t]he composition can be used as a base for a plurality of dilution levels to be used for different applications,” including “as an efflorescence remover on cementitious materials (concrete block, brick, precast, paver, cement, and masonry),” that embodiment is not supported by the words that appear in claim 1. Ex. 1001, 2:38–39, 2:59–61 (written description of the invention, distinguishing “an efflorescence” from a “cementitious material”); *see id.* at 3:23–4:2 (claim 1, requiring “a surface” and “a cementitious material”). To the contrary, the language of claim 1 itself requires removal of a released *cementitious material* from a surface, not removal of a released *efflorescence* from a cementitious material. *Compare id.* at 2:59–60, *with id.* at 4:1–2.

That aspect of the construction is supported by the specification of the ’912 patent, which lists five embodiments of a composition for removing cementitious material from a variety of surfaces. *See* Ex. 1001, 2:38–39, 2:42–45, 2:52–53, 3:1–2, 3:6–7. Four of the embodiments disclose a composition for removing concrete from tools or other equipment. *See id.* In each of those four embodiments, the “formula can be used on, for example, ready-mixed concrete, cement, and masonry.” *Id.* at 2:49–51, 2:56–58, 3:3–

5, 3:10–12. The fifth embodiment describes a composition “that can be used as an efflorescence remover on cementitious materials (concrete block, brick, precast, paver, cement, and masonry).” *Id.* at 2:59–61. The disjunctive use of “efflorescence” and “cementitious materials” implies they are not one and the same, i.e., that “an efflorescence” is not a “cementitious material” in the lexicography of the ’912 patent. *Id.* Taken together, the embodiments provide definitional examples of cementitious materials, which include concrete block, brick, precast, paver, ready-mixed concrete, cement, and masonry, but not an efflorescence. *Id.* at 2:49–51, 2:59–61.

The “efflorescence remover” embodiment does not conform with the other embodiments—or the express limitations of independent claim 1—in “releas[ing] a cementitious material,” given that the description of the embodiment itself distinguishes “an efflorescence” from “cementitious materials.” *Id.* at 2:59–61. Read in light of the specification, therefore, the words of claim 1 do not embrace the “efflorescence remover” embodiment. *Id.* The four other embodiments, however, support construing claim 1 to require “a surface” distinct from “a cementitious material,” exactly as specified in claim 1. *Id.* at 3:28–4:2 (claim 1, specifying both “a surface” as well as “a cementitious material” released “from the surface”).

Where the words of a claim limit its scope to particular embodiments disclosed in a patent, there is no requirement that the claim be construed to encompass all disclosed embodiments. *TIP Sys., LLC v. Phillips & Brooks/Gladwin, Inc.*, 529 F.3d 1364, 1375 (Fed. Cir. 2008); *see SIMO Holdings Inc. v. Hong Kong uCloudlink Network Tech. Ltd.*, 983 F.3d 1367, 1378 (Fed. Cir. 2021) (“[W]e should not infer that any particular embodiment is included in a claim when there is probative evidence that

sufficiently indicates the contrary.”). Although we acknowledge the general maxim that patent claims should be construed to cover the embodiments described in the specification, that rule applies only when the claims “can reasonably be interpreted to include a specific embodiment.” *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008). The plain language of independent claim 1 does not support or address the release or removal of an “efflorescence” from the surface of a cementitious material. Ex. 1001, 2:59.

Although the specification provides that each embodiment is “non-limiting,” *e.g.*, Ex. 1001, 3:13–16, no other part of the ’912 patent’s written description discusses an “efflorescence,” much less suggests that substance is a cementitious material within the scope of claim 1. Given that particular circumstance, we think it is entirely appropriate to limit the terms “surface” and “cementitious material” to the portions of the specification that adequately disclose those terms to the public. *See Alloc, Inc. v. ITC*, 342 F.3d 1361, 1370 (Fed. Cir. 2003); *SciMed Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc.*, 242 F.3d 1337, 1344–45 (Fed. Cir. 2001). When held against the specification’s vague teaching regarding the “efflorescence” embodiment, the remaining embodiments provide a clear “objective standard by which to measure the scope of the term[s].” *Sonix Tech. Co. v. Publications Int’l, Ltd.*, 844 F.3d 1370, 1375 (Fed. Cir. 2017); *compare Trustees of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1366 (Fed. Cir. 2016) (“The patentee cannot rely on its own use of inconsistent and confusing language in the specification to support a broad claim construction which is otherwise foreclosed.”).

The mere fact that an embodiment is disclosed in the specification does not outweigh the language of the claim, or otherwise require the Board

to include that embodiment within the scope of the claim, where a construction excluding the embodiment is supported by the intrinsic evidence. *See August Tech. Corp. v. Camtek, Ltd.*, 655 F.3d 1278, 1285 (Fed. Cir. 2011). Here, the embodiment at hand teaches a composition that is “used as an efflorescence remover on cementitious materials,” but the specification explicitly distinguishes “an efflorescence” from “cementitious materials,” such as “concrete block, brick, precast, paver, cement, and masonry.” Ex. 1001, 2:59–61. And claim 1 requires removal of a “released cementitious material” not “an efflorescence.” *Id.* at 2:59–61, 4:1–2.

To be clear, claim 1 requires removing a “released cementitious material” from “a surface.” *Id.* at 3:28–4:2. Petitioner provides no persuasive reason why an ordinarily skilled artisan would have understood the term “cementitious material” to include “an efflorescence”—indeed, as just noted, the ’912 patent expressly distinguishes those two materials. *Id.* at 2:59–61. Claim 1 does not broadly encompass a step of removing a released efflorescence from a cementitious material, but is limited to by its plain terms to removing a “released cementitious material” from “a surface.” *Id.* at 3:28–4:2; *see also id.* at 2:61–62 (distinguishing “an efflorescence” from “cementitious materials”). In a nutshell, the claim language does not explicitly or implicitly support a construction that broadly encompasses a method of “applying the composition to a surface” *of a cementitious material* to “release” an *efflorescence* (*id.* at 3:28–29), even though one embodiment seems to allow for such use (*id.* at 2:38–39, 2:59–61).

Taking account of the totality of the information presented, we determine that construing “surface” and “cementitious material” using the examples in the majority of the embodiments provided in the ’912 patent

specification is necessary to “tether the claims to what the specification[] indicate[s] the inventor actually invented.” *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1305 (Fed. Cir. 2011). In doing so, we adopt “[t]he construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention . . . [which] in the end, [is] the correct construction.” *Phillips*, 415 F.3d at 1312.

Accordingly, on this record, we construe claim 1, and each other challenged claim through dependence from claim 1, to require a step of applying a composition to “a surface” structurally separate and distinct from the “cementitious material” that is released and removed “from the surface.” *Id.* at 3:28–4:2.

D. Overview of the Asserted Prior Art References

The challenges identified in the Petition advance seven prior art references: Sargent, Sanders, Martin, Rodine MSDS, Netherton, McCormick, and Mancillas. Pet. 6 (grounds chart).

1. Sargent

Sargent is titled “Method for Using Urea Hydrochloride.” Ex. 1006, code (54). Sargent discloses a “[a] method to remove the build-up of water-insoluble metal salts on surfaces, and a method to lower the solids content of industrial liquids that contain water-insoluble metal salts using urea hydrochloride or its equivalent.” *Id.* at code (57). Sargent specifically describes that “[u]rea hydrochloride is especially useful in the removal or dissolution of calcium carbonate,” which is “used or produced in industrial processes” like “in portland cement.” *Id.* at 2:9–11, 1:15–20. Sargent also teaches that “[a]dditives can be added to the urea hydrochloride or

equivalent solution as desired to increase the usefulness of the agent,” including “corrosion inhibitors.” *Id.* at 4:16–19, 4:25.

Sargent also discloses that urea hydrochloride “can also be used as an acid replacement in any process that hydrochloric acid . . . has traditionally been used in, including but not limited to acidizing (activation) or petroleum wells, boiler scale removal, . . . pickling and metal cleaning, industrial acidizing, general cleaning.” *Id.* at 3:21–30. Particularly, Sargent lists “[m]aterials that can be cleaned includ[ing] wire, metals, . . . masonry, mortar, concrete, painted surfaces, . . . and the like.” *Id.* at 3:35–39.

2. *Sanders*

Sanders is titled “Increasing Oil Production.” Ex. 1007, code (54). *Sanders* is directed to compositions and methods “provid[ing] for a low-cost recovery of additional petroleum from sleeping wells as well as enhanc[ing] the petroleum production from active wells in an economically efficient manner.” *Id.* at 1:49–52. *Sanders* also teaches “corrosion inhibitors to protect metal contract surfaces” such as RODINE® 213, which “is a cationic corrosion inhibitor solution containing substituted keto-amine-hydrochlorides and ethoxylated nonylphenols in a base of isopropyl alcohol, propargyl alcohol, methyl vinyl ketone, acetone, and acetophenone.” *Id.* at 9:20–30.

3. *Martin*

Martin is titled “Radioactive Decontamination and Translocation Method.” Ex. 1012, code (54). *Martin* is directed to “[a] method for removing radioactive contaminants from a given surface” using “[a]n acidic solution having a pH of less than 3.0, and preferably less than 1.5, of a complex substituted keto-amine, and a mixture of a saturated and

unsaturated lower alcohol (e.g. isopropyl alcohol and propargyl alcohol), and concentrated acid is applied to a contaminated surface.” *Id.* at code (57).

Particularly, Martin discloses “a decontamination solution . . . formed containing a complex substituted keto-amine, and alcohol mixture which is preferably isopropyl alcohol and propargyl alcohol, and concentrated acid,” which “may be [a] strong . . . acid such as hydrochloric acid.” *Id.* at 4:16–20. Martin further describes hydrochloric acid “used in a concentrated aqueous solution of about 32% to 38% hydrochloric acid,” with

between about 0.1 to 2%, and preferably between 0.4 and 0.6%, of the complex substituted keto-amine, about 0.1 to 0.5% of the saturated lower alcohol (e.g. isopropanol) and 0.1 to 0.5% of the unsaturated lower alcohol (e.g. propargyl alcohol) with the remainder being the concentrated acid sufficient to provide a pH of 3.0 or below and preferably of 1.5 or below.

Id. at 4:23–26, 4:32–39.

4. Rodine MSDS

Rodine MSDS, a material safety data sheet for “RODINE 213,” discloses the composition of a product manufactured by Henkel Surface Technologies and Henkel Corporation. Ex. 1008, 1. Particularly, RODINE MSDS discloses a composition consisting of ranges of complex substituted keto-amine-hydrochloride, isopropyl alcohol, ethoxylated nonylphenol, propargyl alcohol, methyl vinyl ketone, acetone, and acetophenone. *Id.*

5. Netherton

Netherton is titled “Concrete Cleaning and Preparation Composition.” Ex. 1009, code (54). Netherton discloses “[a] concrete cleaning and preparation composition” and “a method of preparing a concrete surface,

including pre-wetting a concrete surface, using a cleaning and preparation composition, including urea hydrochloride, a surfactant, water, and one or more glycol ethers, and rinsing the concrete surface.” *Id.* at code (57).

Netherton also teaches that “other additives may be included in the cleaning and preparation composition,” including “corrosion inhibitors.” *Id.* 4:26–53.

6. *McCormick*

McCormick is titled “Corrosion Inhibitor Formulations with Improved Performance, Lower Toxicity and Reduced Manufacturing Hazards.” Ex. 1010, code (54). McCormick discloses “[a]queous corrosion inhibitor compositions, preferably storage-stable, useful in acidic cleaning solutions for cleaning the surfaces of metal, comprising reaction products of at least one rosin amine component, at least non-flammable liquid ketone component, . . . and water; aqueous acidic cleaners prepared therefrom; and methods of their use.” *Id.* at code (57).

7. *Mancillas*

Mancillas is titled “Acid Inhibitor Composition for Use in Well Acidizing Operations.” Ex. 1011, code (54). Mancillas “relates to the acidizing of a subterranean formation using an acidic solution containing a corrosion inhibitor which substantially reduces the corrosive effects of the acidic solution on metals in contact with the acidic solution.” *Id.* at 1:5–12. “The acidic solution can comprise, for instance, a solution of hydrochloric acid . . . and mixtures thereof.” *Id.* at 4:13–16. “The corrosion inhibitor comprises a mixture of: a complex substituted keto-amine; an acetylenic alcohol; an alkanol; a rosin acid component; a non-ionic surfactant; and an antimony compound.” *Id.* at 4:16–29.

E. Grounds that Assert Sargent

Petitioner raises three grounds of unpatentability that assert Sargent. Pet. 6, 18–46. Petitioner asserts that the subject matter of (1) claims 1–4, 7, and 8 would have been obvious over Sargent and Sanders (Pet. 18–25); (2) claims 5 and 6 would have been obvious over Sargent, Sanders, and Martin (Pet. 25–36); and (3) claims 1, 5, and 6 would have been obvious over Sargent, Rodine MSDS, and Martin (Pet. 36–46). As discussed below, we determine that Petitioner has not sufficiently shown that the subject matter of independent claim 1 or dependent claims 5 and 6 would have been obvious over the combined disclosures asserting Sargent. Our analysis of independent claim 1 applies with equal force to each of the claims challenged under these grounds.

In this section, we focus on whether the subject matter of any challenged claim would have been obvious in view of any ground that asserts Sargent. Pet. 18–46. We organize this section into three subparts, addressing in turn (1) whether Sargent releases cementitious material from a surface as specified in independent claim 1; (2) whether the concentration and dilution limitations of claims 5 and 6 would have been obvious over the asserted prior art; and (3) our conclusions on the grounds that assert Sargent.

*1. Whether Sargent Releases a
Cementitious Material as Specified in Claim 1*

These challenges turn on the factual issue of “whether Sargent releases cementitious material from a surface, or instead, cleans a surface made of a cementitious material.” Dec. 22 (citing Ex. 1006, 3:36–39 (indicating that “mortar” or “concrete” is the material that comprises the surface in Sargent, not necessarily the material removed or released from the

surface)). Petitioner argues that claim 1 broadly encompasses a method of applying a composition to a surface made of cementitious material and removing a portion of that cementitious material from that surface. Pet. 22. Patent Owner, by contrast, argues that the claims require removing a cementitious material from a surface that “must be distinct from (as opposed to being made of) the cementitious material.” Resp. 6. Patent Owner submits that “[i]t would be absurd to hold that cleaning a surface involves removing the surface from the surface.” *Id.* at 7.

In our decision instituting review, we placed Petitioner on notice of our concerns about this issue and now find, for reasons explained in our claim construction analysis, that claim 1 requires “a surface” that is distinct from “a cementitious material” that is removed “from the surface.” Ex. 1001, 3:28–4:2. In this section, we explain why, under the correct claim construction, Petitioner does not show persuasively that Sargent removes “a cementitious material” from “a surface.” *Id.*

According to Petitioner, Sargent removes calcium carbonate, which as a result of Sargent’s method is “dissolved from the surface” of masonry (that is, a cementitious material). Pet. 22; *see* Ex. 1006, 2:9–11 (Sargent’s disclosure that “[u]rea hydrochloride is especially useful in the removal or dissolution of calcium carbonate”). In that manner, according to Petitioner, Sargent’s method will “release at least a portion of” a “cementitious material, such as calcium carbonate.” Pet. 22. In the Reply, Petitioner repeats the view that “calcium carbonate is cementitious material released from a surface (that is either of an underlying equipment or concrete).” Reply 14. In support of that factual assertion, Petitioner directs us to the Declaration of Richard Hutchins, in which Mr. Hutchins repeats that

contention, without citing any supporting objective proof that “calcium carbonate is cementitious material.” *Id.* (citing Ex. 1003 ¶ 103).

Sargent discloses “that urea hydrochloride is an inexpensive and useful agent for the removal of the build-up of water-insoluble metal salts on surfaces, and the dissolution of water-insoluble metal salt dispersions or suspensions.” Resp. 21–22 (quoting Ex. 1006, 2:3–6). Although the background section of the ’912 patent describes the “removal of water-insoluble cementitious and lime materials” as “a difficult process,” Petitioner directs us to no evidence sufficient to establish that calcium carbonate is “a cementitious material” within the meaning of claim 1. Ex. 1001, 1:13–14, 3:28–29; *see* Pet. 22; Reply 14 (totality of Petitioner’s information on point). Instead, in conclusory fashion, Petitioner simply assumes that Sargent’s disclosure of “water-insoluble metal salt dispersions or suspensions” and “calcium carbonate” constitute “cementitious material” within the scope of claim 1. Reply 14; *see* Pet. 22 (relying on Sargent’s disclosure of the removal of “calcium carbonate”); *see also* Ex. 1003 ¶ 103 (conclusory opinion cited at Pet. 22 and Reply 14).

Further, Petitioner assumes that the “applying” and “removing” steps of claim 1 are satisfied by Sargent’s application of a composition “to a surface of a cementitious material to release a portion of the cementitious material therefrom.” Pet. 16 (Petitioner’s emphasis). Specifically, Petitioner argues that Sargent teaches the removal of released cementitious material from the surface because an ordinarily skilled artisan “would understand that a result of Sargent’s rinsing process is to remove the composition by rinsing with water, which will also release at least a portion of any cementitious

material, such as calcium carbonate, dissolved from the surface.” *Id.* at 22 (citing Ex. 1006, 6:57–7:2; Ex. 1003 ¶ 103).

For reasons explained above in our claim construction analysis, however, we construe claim 1 to require application of the composition to a surface distinct from the cementitious material being removed from the surface. *See supra* II.C.2. As Patent Owner contends, “It would be absurd to hold that cleaning a surface involves removing the surface from the surface,” because “[t]he background section of the ’912 Patent clearly contemplates that surfaces to be cleaned include surfaces of vehicles and that it is undesirable to ‘damage the target surface.’” Resp. 7 (citing Ex. 1001, 1:46).

As explained above, we do not give limiting effect to the preamble of claim 1, which describes “cleaning a surface of a cementitious material.” Ex. 1001, 3:23–24. The body of the claim makes clear that the method of the invention is accomplished by “applying” the specified “composition to a surface” and “removing the composition and released cementitious material from the surface.” *Id.* at 3:25–4:2. When read together, those limitations set forth in the body of claim 1 describe a method whereby a cementitious material is removed off of a surface of another material, rather than stripping away part of the surface itself. *See* Resp. 7 (“Dissolving a surface is not cleaning a surface.”). By its express terms, claim 1 distinguishes “the surface” from “the cementitious material” removed “from the surface.” Ex. 1001, 3:28–4:2. Petitioner’s view that Sargent, by releasing “a portion of the cementitious material” after applying the composition “to a surface of a cementitious material,” rests on an incorrect interpretation of claim 1.

Pet. 16.

To the extent that Sargent teaches “[a] method to remove the build-up of water-insoluble metal salts on surfaces,” and “[m]aterials that can be cleaned includ[ing] . . . metals, . . . masonry, mortar, concrete, painted surfaces, plastics, . . . and the like” (Ex. 1006, 1:56–58, 3:35–39), Petitioner does not direct us to any information sufficient to establish that water-insoluble metal salts or calcium carbonate constitute “cementitious material” as specified in claim 1 (Ex. 1001, 3:28–4:2). *See* Pet. 22; Reply 14; (Petitioner’s information on point); *see also* Ex. 1003 ¶ 103 (conclusory opinion testimony on point). Petitioner does not establish that Sargent releases a cementitious material from a surface within the scope of claim 1. *See* Ex. 1006, 2:9–11, 3:28–30, 3:34–39, 6:65–7:2 (relevant disclosures in Sargent). On this record, we determine that Petitioner fails to carry its burden of demonstrating by a preponderance of the evidence that Sargent teaches the method step of “applying the composition to a surface to release a cementitious material therefrom.” Ex. 1001, 3:28–29. That finding fully disposes of the grounds asserting Sargent. *See* Pet. 18–46.

2. Claims 5 and 6

An alternative rationale supports our determination that Petitioner does not demonstrate by a preponderance of the evidence that claims 5 and 6 (which depend from claim 1) are unpatentable as obvious over any ground that asserts Sargent. Pet. 6 (grounds chart). Petitioner asserts that the concentration requirements of claim 5, as well as the dilution requirements of 6, would have been obvious over (1) Sargent, Sanders, and Martin (*id.* at 25–36), or (2) Sargent, Rodine MSDS, and Martin (*id.* at 39–46).

Claim 5 specifies a concentration range for HCl (“40–60 wt %”) as well as precise numerical values (as opposed to ranges) for *eight* other

components of the composition. Ex. 1001, 4:10–15. In particular, claim 5 sets forth precise concentration values for urea (42 wt %), complex substituted keto-amine-hydrochloride (0.067 wt %), isopropyl alcohol (0.067 wt %), ethoxylated nonylphenol (0.022 wt %), propargyl alcohol (0.022 wt %), methyl vinyl ketone (0.022 wt %), acetone (0.022 wt %), and acetophenone (0.0022 wt %). *Id.* Claim 6 also depends from claim 1, but adds an additional limitation related to the permissible range of HCl dilution levels in a requirement that specifies “diluting the composition with water in a range of 1:1 to 6:1 water:composition.” *Id.* at 4:16–18.

We previously expressed our doubts about the sufficiency of Petitioner’s information with respect to claims 5 and 6. Dec. 24–29. In particular, we observed with respect to claim 5, Petitioner fails to explain adequately how the prior art, without the benefit of hindsight gleaned from the disclosure of the ’912 patent, would have led to a composition that satisfies every precise concentration requirement. *Id.* at 24–27; *see* Pet. 25–34, 39–44; *see also* Reply 14–15 (arguing that an ordinarily skilled artisan “only has to match the HCl acid concentrations across references to then adjust the [complex substituted keto-amine-hydrochloride] concentration based on the ratio and amount of HCl acid used” and “then proportionally change the rest of the ingredients from *Sanders* and *Rodine* to the [complex substituted keto-amine-hydrochloride] concentration matched from *Martin*.”). For example, claim 5 recites a precise concentration value for acetophenone in terms of thousandths of a percentage point (0.0022 wt %), and Petitioner does not explain adequately how or why the prior art would have suggested that particular value. Ex. 1001, 4:15; *see* Pet. 30 (arguing that the prior art suggests an “estimated” concentration range of “0.1–0.5”

wt. % for acetophenone), 43 (arguing that the prior art suggests a “calculated” concentration range of “< 0.01” wt. % for acetophenone).

Petitioner acknowledges that the prior art does *not* suggest a modified composition that meets the concentration values recited in claim 5, but contends instead that the references would have led an ordinarily skilled artisan to concentrations “close to” or “overlapping” the recited values. Pet. 27, 31–32, 41, 43–44. Petitioner selects ingredients from disparate embodiments disclosed in multiple prior art references to arrive at a modified composition that fails to meet even one of the exact numerical values specified in claim 5. *Id.* at 27, 29–30, 41–43. Furthermore, with one exception, Petitioner directs us to relatively broad *ranges* of concentrations (as opposed to concentration *values*) in the prior art to make out the exact values recited in claim 5. *Id.* (identifying broad ranges of concentrations in the prior art for all composition components, except for the complex substituted keto-amine-hydrochloride). Petitioner does not explain adequately, if at all, why those ranges would have led an ordinarily artisan to the precise combination of exact values required by claim 5. *Id.*

In the one case where Petitioner does not rely on a range, Petitioner contends that an ordinarily skilled artisan “would understand,” under the circumstances, “that to get 0.1 wt % of complex substituted keto-amine-hydrochloride suggested by Martin for the HCl amounts in Sargent, a solution with the urea hydrochloride from Sargent and Martin must use 1/100th of the Rodine MSDS corrosion inhibitor,” and divide “the remaining components of Rodine MSDS . . . in 1/100th of disclosed concentrations.” Pet. 42 (citing Ex. 1003 ¶ 167). Petitioner’s argument that Martin would have suggested a concentration value of 0.1 wt % for complex

substituted keto-amine-hydrochloride, as compared to the specified concentration value of 0.067 wt %, is the only instance where Petitioner identifies a disclosed value (as opposed to a range) for the concentration of a specified component in the prior art. *Id.*

Petitioner does not explain adequately why the value of 0.1 wt % (at best suggested by Martin) would have made obvious the specified concentration of 0.067 wt %. *Id.* Neither the disclosed value of the complex substituted keto-amine-hydrochloride component, nor the resulting concentration ranges for the other components, teach the exact combination of numerical values specified in claim 5. Petitioner submits only that the prior art discloses ranges that come “close to”—or, at best, “overlap”—the precise concentrations specified in claim 5. *See id.* at 29–30, 42–43.

On this record, Petitioner does not direct us to persuasive evidence that the prior art would have led an ordinarily skilled artisan to a composition characterized by eight ingredients having the exact combination of precisely defined concentrations (expressed as exact numerical values rather than *ranges* of values). Ex. 1001, 4:10–15; *see* Pet. 30–31 (information on point). Petitioner does not explain how or why any concentration value recited in claim 5, much less the collection of eight values in combination, would have been recognized as result-effective variables or achievable through routine experimentation. *See* Pet. 25–34, 39–44 (Petitioner’s conclusory assertions regarding optimization of these values through routine experimentation); *see also In re Antonie*, 559 F.2d 618, 620 (CCPA 1977) (a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before

the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation).

Whether undue experimentation is needed is not a single, simple factual determination, but rather, is a conclusion reached by weighing many factual considerations. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988). On this record, Petitioner's arguments, pertaining to routine experimentation that would have led to the combination of the eight concentration values specified in claim 5, are not developed adequately. *See* Pet. 25–34, 30–31, 39–44 (relevant arguments). To the contrary, those arguments appear to be driven, not by any path illuminated by the prior art, but rather, by an impermissible exercise of hindsight reconstruction based on the disclosures of the '912 patent, for example, the particular combination of concentration values recited in claim 5. *Id.*; *see, e.g., In re McLaughlin*, 443 F.2d 1392, 1395 (CCPA 1971) (“Any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning, but so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made and does not include knowledge gleaned only from applicant's disclosure, such a reconstruction is proper.”).

Petitioner argues that the concentration values recited in claim 5 are not critical to the claimed invention and, on that basis, suggests that the Board is free to disregard them as “arbitrary, or at best, understood from the cited references.” Pet. 44. Although “independent claim 1 expressly allows for a wide range[] of concentrations of components as evidenced by its lack of specificity,” we are not persuaded that we should ignore the express and specific concentration values recited in claim 5 or read into the prior art an “understood” but unexpressed disclosure of those concentration values. *Id.*

at 43–44 (and reference back to Pet. 35–36). Notwithstanding Petitioner’s citations to the Manual of Patent Examining Procedure, Petitioner does not direct us to any evidence that prior art discloses a cluster of concentration *ranges* that “are so close” to the eight concentration *values* specified in claim 5 “that prima facie one skilled in the art would have expected them to have the same properties.” MPEP § 2144.05(I) (9th ed. rev. 10.2019 June 2020) (quoting *Titanium Metals Corp. of America v. Banner*, 778 F.2d 775, 783 (Fed. Cir. 1985)).

Petitioner’s view that an ordinarily skilled artisan *could* have varied concentrations of the eight ingredients of the composition specified in claim 1, “without departing from the spirit of the invention,” that circumstance does nothing to show why the artisan *would* have selected the precise combination of concentration values recited in claim 5 with a reasonable expectation of success. Pet. 31–32, 44. Petitioner overlooks that “obviousness concerns whether a skilled artisan *not only could have made but would have been motivated to make* the combinations or modifications of the prior art to arrive at the claimed invention.” *Belden v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis added). Petitioner’s argument, moreover, is not tethered adequately to prior art disclosures, but instead relies overtly and, in our view, inappropriately on the ’912 patent disclosure and, in particular, uses as a road map the eight concentration values specified in claim 5. Pet. 25–32, 39–44. That circumstance tends to support a conclusion that hindsight bias taints Petitioner’s line of argument.

We find insufficient Petitioner’s further view that “[t]he ’912 patent does not specify any uniqueness from its recited concentrations” to support “the patentability of subject matter encompassed by the prior art.” Pet. 44

(citing MPEP § 2144.05(II)). Petitioner does not show sufficiently that the concentrations recited in claim 5 would have been viewed as result-effective variables that would have been optimized through “routine experimentation” of a generally known composition. Pet. 30. Petitioner also ignores the express objectives, reflected in the ’912 patent disclosure, of “providing a composition . . . effective at removing cementitious materials from surfaces without . . . damag[ing] the target surface and releas[ing] harmful substances . . . into the environment.” Ex. 1001, 1:43–50.

Similar deficiencies are evident in the information advanced in the Petition in connection with claim 6. Pet. 34–36, 44–46. Claim 6 specifies a dilution “range of 1:1 to 6:1 water:composition.” Ex. 1001, 4:16–18. The Petition lacks adequate analysis and reasoning for why the proposed combinations of prior art references would have led an ordinarily skilled artisan to a dilution value “in an overlapping range or” one “that is close to the claimed range of 1:1 to 6:1.” Pet. 35, 45–46. Petitioner again suggests that optimization, through routine experimentation, would have led an ordinarily skilled artisan to the specified dilution range. *Id.* Critically absent, however, is an adequate showing that the dilution range would have been recognized as a result-effective variable or that experimentation, necessary to ascertain an optimal range, would have been within the level of ordinary skill in the art. *Id.*

Alternatively, Petitioner suggests, the required dilution range is “arbitrary, or at best, understood from the cited references.” *Id.* at 36, 46. Here again, we are not persuaded that we should ignore express claim limitations or read into the prior art an “understood” but unexpressed disclosure. *Id.* On this record, we determine that Petitioner fails to carry its

burden of demonstrating by a preponderance of the evidence that the asserted combinations teach the concentration requirements of claim 5 or the dilution limitation of claim 6. *See* Pet. 25–36, 39–46.

3. Conclusions on the Grounds that Assert Sargent

We determine that Petitioner does not show by a preponderance of the evidence that the subject matter of any challenged claim would have been obvious based on the grounds that assert Sargent. In particular, Petitioner fails to demonstrate persuasively that Sargent releases a cementitious material from a surface as required by claim 1 and, through dependence from claim 1, every other challenged claim. Further, Petitioner does not show by a preponderance of the evidence that an ordinarily skilled artisan, without the benefit of hindsight gleaned from the disclosure of the '912 patent, would have been led to a composition that satisfies the precise concentration requirements of claim 5 or the dilution limitation of claim 6.

F. Ground that Asserts Netherton

Petitioner advances a single ground that asserts Netherton. Pet. 6. Specifically, in Petitioner's view, claims 1–4 and 6–8 are unpatentable as obvious over Netherton in view of McCormick and Mancillas. *Id.* at 46–56. In our decision instituting this review, we expressed our concerns about the adequacy of Petitioner's showing as to this ground. Dec. 29–30. Petitioner has not sufficiently addressed our concerns and has not demonstrated by a preponderance of the evidence that any challenged claim is unpatentable based on the ground that asserts Netherton. The following analysis applies with equal force to each claim challenged in that ground.

Petitioner relies on Netherton for its disclosure of “a concrete cleaning and preparation composition, including urea hydrochloride.” Pet. 47

(quoting Ex. 1009, 2:20–22). Petitioner turns to Mancillas for a corrosion inhibitor comprising “a complex substituted keto-amine” and an “alcohol.” Pet. 47–48 (quoting Ex. 1011, 7:5–9). Petitioner then turns to McCormick for “the ethoxylate and ketone components” of claim 1, which are lacking in the composition of Netherton even as modified by Mancillas. *Id.* at 48.

Patent Owner raises six arguments related to this challenge in its Response. *See* Resp. 47–59. First, Patent Owner argues, Netherton does not clean a cementitious material from a surface. *Id.* at 47–48. Second, Patent Owner argues that Mancillas and McCormick are not reasonably pertinent to Netherton’s problem of “providing a cleaning and preparation composition ‘formulated so that it can be used by a do-it-yourselfer safely and easily, with no training and by following minimal instructions.’” *Id.* at 48–50 (quoting Ex. 1009, 2:62–65). Third, Patent Owner contends that Petitioner fails to identify the rosin acid component of Mancillas, making it “difficult to see how Mancillas’s rosin acid component, and hence its formulation, could even be produced without undue experimentation.” *Id.* at 50–52. Fourth, Patent Owner argues, an ordinarily “skilled artisan would have expected [Mancillas’s] unidentified rosin acid components to be sticky and to conflict with the intended cleaning purpose of Netherton.” *Id.* at 52–53 (quoting Ex. 2010, 20). Fifth, Patent Owner contends that McCormick’s identified rosin amine derivative would similarly be unsuitable for Netherton’s intended purpose because it imparts serious material safety and health risks for users. *Id.* at 54–56. Sixth, Patent Owner argues that Petitioner directs the Board to no persuasive evidence that the components of Netherton, McCormick, and Mancillas would have been compatible. *Id.* at 56–59.

In its Reply, Petitioner merely restates Patent Owner’s arguments and concludes that “Patent Owner’s rationale is misguided and based on irrelevant considerations.” Reply 21. In addition, Petitioner contends, “None of [Patent Owner’s] allegations are proper or relevant because the Petition details that *Mancillas* addresses the corrosion inhibitor requirements applied to HCl acid solutions and because *Netherton* is relied upon for the feature of releasing a cementitious material therefrom using HCl acid solutions.” *Id.* (citing Pet. 47–48, 51).

In addition, Petitioner argues that “the references are considered in combination, as a whole,” but merely cites the Petition’s combination of *Mancillas*, to disclose the corrosion inhibitor, with *Netherton*, to teach the removing limitation—without explaining adequately why, or directing us to evidence showing that, an ordinarily skilled artisan would have been prompted to combine these references in the manner claimed, or have a reasonable expectation of success in doing so. Reply 21–22 (citing MPEP § 2141.02 (9th ed. rev. 10.2019, June 2020)).

Petitioner’s only explanation for the proposed combination appears to be that “*McCormick*’s constituent chemicals . . . may be used with *Mancillas*’s corrosion inhibitors (as they are both including rosin acid derivatives) without burdensome experimentation.” *Id.* (citing Resp. 49–50 (acknowledging that McCormick uses a rosin amine derivative and has associated health risks)); *see* Ex. 1003 ¶¶ 185–92. That statement is conclusory. Accordingly, we agree with Patent Owner that “Petitioner’s assumption that all components would be compatible” is not supported by a preponderance of the evidence. Sur-reply 21.

In our decision instituting this review, we expressed our concerns about whether an ordinarily skilled artisan would have been “motivated to use the concentrations and components suggested in McCormick with the corrosion inhibitor in Mancillas to ensure that the complex substituted keto-amine component in Mancillas is diluted as required for the HCl concentration used in Netherton.” Dec. 29 (citing Pet. 50). We also expressed our concerns about whether an ordinarily skilled artisan “would also secure the concentrations for the remaining components forming the complex substituted keto-amine-based corrosion inhibitor.” *Id.* at 30 (citing Pet. 48–50; Ex. 1003 ¶¶ 185–92). Even with this understanding of our concerns, Petitioner has not adequately pointed to any objective proof within the asserted prior art to overcome those concerns.

Accordingly, on this record, we determine that Petitioner fails to demonstrate by a preponderance of the evidence that the subject matter of any challenged claim would have been obvious to an ordinarily skilled artisan based on the combination of Netherton, McCormick, and Mancillas.

III. CONCLUSION

For the above reasons, Petitioner does not demonstrate by a preponderance of the evidence that any challenged claim is unpatentable based on any challenge stated in the Petition.

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–4, 7, 8	103(a)	Sargent, Sanders		1–4, 7, 8
5, 6	103(a)	Sargent, Sanders, Martin		5, 6

Claims	35 U.S.C. §	References	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 5, 6	103(a)	Sargent, Rodine MSDS, Martin		1, 5, 6
1–4, 6–8	103(a)	Netherton, McCormick, Mancillas		1–4, 6–8
Overall Outcome				1–8

VI. ORDER

It is

ORDERED that claims 1–8 of the '912 patent have not been proven unpatentable on this record;

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

IPR2021-00357
Patent 7,938,912 B1

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