

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PIONEER PET PRODUCTS, LLC,
Petitioner,

v.

OIL-DRI CORPORATION OF AMERICA,
Patent Owner.

IPR2022-00691
Patent 9,439,393 B1

Before MICHAEL L. WOODS, RICHARD H. MARSCHALL, and
ALYSSA A. FINAMORE, *Administrative Patent Judges*.

MARSCHALL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

Petitioner Pioneer Pet Products, LLC challenges claims 1–17 of U.S. Patent No. 9,439,393 B1 (Ex. 1001, “the ’393 patent”), which is assigned to Patent Owner Oil-Dri Corporation of America. We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 (2019). For the reasons set forth below, we determine that Petitioner has not shown that any of the challenged claims of the ’393 patent are unpatentable.

BACKGROUND

A. Procedural History

Petitioner filed a Petition requesting *inter partes* review of the challenged claims. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply (Paper 8), and Patent Owner filed a Preliminary Sur-reply (Paper 9). Pursuant to 35 U.S.C. § 314, we instituted an *inter partes* review as to all challenged claims and all grounds raised in the Petition. Paper 10 (“Institution Decision” or “Inst. Dec.”).

After institution, Patent Owner filed a Response (Paper 15, “PO Resp.”), Petitioner filed a Reply (Paper 16, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 21, “PO Sur-reply”). Patent Owner also filed a Motion to Exclude (Paper 25), Petitioner filed an Opposition to that Motion (Paper 26), and Patent Owner filed a related Reply (Paper 27). An oral hearing in this proceeding was held on June 14, 2023, and a transcript of the hearing is included in the record (Paper 30, “Tr.”).

B. The ’393 Patent

The ’393 patent relates to “cat litter products” and, in particular, litter products using “[s]welling clay made of sodium bentonite” and various

fillers. Ex. 1001, code (57), 1:25–29. The '393 patent also states that clumping cat litter products made of sodium bentonite have “the disadvantage of being relatively expensive” (*id.* at 1:25–29), but litter products made of sodium bentonite and fillers retain “substantially the same clumpability properties as a composition consisting of only the sodium bentonite” (*id.* at code (57)). According to the '393 patent, based on a number of test results set forth in the specification, the key to achieving removably clumpable litter compositions involves including a specific amount of sodium bentonite in the litter blend—a minimum of 47% of the total external surface area of all particles in the litter must originate from the sodium bentonite. *See id.* at 45:31–60.

The '393 patent describes a litter composition's ability to clump in considerable detail. In the “Definitions” section, the '393 patent defines “removably clumpable” as wetted litter that “forms one or more clumps having a firmness of sufficient structural integrity and hardness to withstand mechanical separation from unwetted litter.” Ex. 1001, 5:24–28. That same section of the '393 patent states that a “litter that is removably clumpable, i.e., has a clump strength of ≤ 1.33 using the Standard Drop Method Test, has a clump strength that is substantially the same as a litter comprised of only the sodium bentonite of the litter.” *Id.* at 5:33–36.

The '393 patent also describes the clump strength test using the Standard Drop Method Test. *See* Ex. 1001, 10:52–11:56, Figs. 4–5 (depicting dropping device used in Standard Drop Method Test). The clump strength test involves removing a clump of wetted litter after a specified time period and placing it on a swinging platform 12 inches above an aluminum pan. *Id.* at 10:55–11:1. After dropping the clump from the platform into the

pan, “the clump is visually examined for breakage and assigned a rating on a scale from 1 to 3,” with the scale being: “1: clump intact, no breakage; 2: slight breakage (clumps break into 2 pieces); and 3: moderate breakage (clump breaks into more than 2 pieces).” *Id.* at 11:1–5, Fig. 6 (depicting three types of clump breakage used in rating system). After repeating the test using additional clumps, an average clump strength rating is reported. *Id.* at 11:5–7.

The ’393 patent provides dozens of examples of clump strength results by testing various litter compositions at various time intervals after applying a wetting agent to the litter. *See* Ex. 1001, 15:33–46:20. Many of those examples include litters comprised of sodium bentonite in combination with a calcium bentonite filler. *See id.* Several examples include litters comprising sodium bentonite in combination with cellulose-containing materials such as paper granules, wood fiber particles, and barley grains. *See id.* at 30:55–35:37 (describing Examples 26–30 with litters employing cellulose-containing filler materials).

C. Challenged Claims

Petitioner challenges claims 1–17 of the ’393 patent, of which claims 1 and 10 are independent. Pet. 2. Independent claim 1 is reproduced below:

1. A composition comprising:
a mixture comprising sodium bentonite and one or more granular filler materials,
wherein the one or more granular filler materials comprise one or more cellulose-containing materials,
wherein sodium bentonite comprises at least 47% of the total external surface area of the mixture,
wherein the one or more granular filler materials comprise 5% to 53% of the total external surface area of the mixture, and

wherein the mixture is removably clumpable.

Ex. 1001, 49:42–50:4.

D. Asserted Grounds of Unpatentability

Petitioner challenges claims 1–17 on the following grounds (Pet. 2):

Claims Challenged	35 U.S.C. §	References/Basis
1–17	103	Hughes, ¹ Winkleman ²
1–17	103	House, ³ Winkleman
1–17	103	Goss, ⁴ Winkleman, House

Petitioner supports its challenges with declarations from Marvin L. Raymond. Exs. 1006 (submitted with the Petition), 1015 (submitted with Petitioner’s Reply). Patent Owner relies on the declaration of Clifford T. Johnston, Ph.D. Ex. 2013.

ANALYSIS

A. Legal Standards

To prevail in its challenges, Petitioner must prove unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2018). “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) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never

¹ US 5,503,111, issued April 2, 1996 (“Hughes,” Ex. 1002).

² WO 2010/056321 A1, published May 20, 2010 (“Winkelman,” Ex. 1003).

³ US 5,188,064, issued Feb. 23, 1993 (“House,” Ex. 1004).

⁴ US 5,975,019, issued Nov. 2, 1999 (“Goss,” Ex. 1005).

shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burdens of proof in an *inter partes* review).

Petitioner relies on obviousness in its challenges. A claim is unpatentable as obvious under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations, also known as objective indicia of non-obviousness.⁵ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

An obviousness analysis must include a reason, based upon rational underpinnings, why a person of ordinary skill would have been motivated to modify the prior art to achieve the claimed invention. *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner . . . must . . . articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” (citing *KSR*, 550 U.S. at 418)). The requirement of a reason to combine is a safeguard against hindsight bias, which is characterized by the “temptation to read into the prior art the teachings of the invention in issue.” *KSR*, 550 U.S. at 421 (quoting *Graham*, 383 U.S. at 36).

⁵ The parties do not address any objective indicia of nonobviousness.

B. The Level of Ordinary Skill in the Art

The level of ordinary skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *Id.*

Petitioner contends that a person having ordinary skill in the art (“PHOSITA”) “would have at least a bachelor of science degree in chemistry, mineralogy, geological science, material science, chemical engineering, or mining engineering with at least two to five years of work experience relating to designing specific chemical mixtures including clay or other minerals, particularly absorbents.” Pet. 33 (citing Ex. 1006 ¶ 38). Patent Owner does not dispute Petitioner’s proposed definition of the level of ordinary skill in the art. *See* PO Resp. 22 (“For purposes of this proceeding, Patent Owner does not dispute Petitioner’s proposed level of ordinary skill in the art.”).

We adopt the definition of the level of ordinary skill in the art proposed by Petitioner because it appears consistent with the record, including the prior art. *In re GPAC Inc.*, 57 F.3d at 1579.

C. Claim Construction

Pursuant to 37 C.F.R. § 42.100(b), we construe the claims under the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). That is, the claim terms are generally given their plain and ordinary meaning as would have been understood by one skilled in the art at the time of the invention and in the context of the entire patent disclosure. *Id.* at 1312–13. Only terms in controversy need be construed, and only to the extent necessary to resolve the controversy. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner proposes constructions for the claim terms “blend,” “cellulose-containing material,” “granular,” “mixture,” and “removably clumpable.” Pet. 31–32. As to “removably clumpable,” which appears in both independent claims 1 and 10, Petitioner quotes a portion of the “Definitions” section from the ’393 patent and asserts that we should construe the limitation to mean “a litter that, when exposed to a wetting agent forms one or more clumps having a firmness of sufficient structural integrity and hardness to withstand mechanical separation from unwetted litter for disposal.” *Id.* at 32 (quoting Ex. 1001, 5:24–28). Patent Owner does not dispute Petitioner’s constructions for the first four terms, but disputes Petitioner’s construction of “removably clumpable.” PO Resp. 22–23. We need only construe “removably clumpable” to resolve the issues in this Decision, and we do not reach the other claim constructions proposed by Petitioner. *See Nidec*, 868 F.3d at 1017.

Patent Owner argues that the “Definitions” section of the specification expressly defines “removably clumpable” in the following paragraph:

For purposes of the present invention, the term “removably clumpable” refers to a litter that, when exposed to a wetting agent forms one or more clumps having a firmness of sufficient structural integrity and hardness to withstand mechanical separation from unwetted litter for disposal. ***A litter material having a clump strength of ≤ 1.33 using the Standard Drop Method Test*** (described below) 30 seconds, 1 hour, 12 hours, 24 hours, 36 hours or 72 hours after the clump is formed by exposure to a liquid ***is removably clumpable***. ***A litter that is removably clumpable, i.e., has a clump strength of ≤ 1.33 using the Standard Drop Method Test***, has a clump strength that is substantially the same as a litter comprised of only the sodium bentonite of the litter.

PO Resp. 23–24 (quoting Ex. 1001, 5:24–36). Patent Owner contends that this passage makes clear that it “defined the term ‘removably clumpable’ to mean a litter having a clump strength of ≤ 1.33 using the Standard Drop Method Test at various times after the clump has formed.” *Id.* at 24 (citing Ex. 1001, 5:24–36, 11:5–7). Patent Owner further contends that Petitioner abandoned the claim construction it proposed in the Petition in its pre-Institution Decision Preliminary Reply, and that Petitioner now agrees with Patent Owner’s proposal, which we adopted in the Institution Decision. *Id.* (citing Paper 8, 1; Ex. 2012, 23:13–24:1).

In its post-Institution Decision Reply, Petitioner does not dispute that Patent Owner’s proposed construction applies and appears to apply it in its analysis. *See* Pet. Reply 5–7, 9.

Based on our review of the record, we determine that “removably clumpable” in independent claims 1 and 10 refers to a mixture having “a clump strength of ≤ 1.33 using the Standard Drop Method Test” in addition

to the other aspects of the “removably clumpable” definition provided in the specification. *See* Ex. 1001, 5:24–36. This is the same conclusion we reached in IPR2022-00206, which addresses the same issues raised here. *See* IPR2022-00206, Paper 9 at 9–13. As we noted in that Decision, the paragraph containing the phrase “a clump strength ≤ 1.33 using the Standard Drop Method Test” appears within the “Definitions” section of the specification, and the use of the term “i.e.” just prior to the phrase signals an intent to define the limitation. *See id.* at 9–10; Ex. 1001, 3:63, 5:24–36.⁶ We also pointed out that the ’393 patent’s Example 26, which discloses a clump strength of ≤ 1.33 at the 24-hour mark but clump strengths above 1.33 at the three other time periods, still falls within the scope of the definition of “removably clumpable.” IPR2022-00206, Paper 9 at 11–12. The “definitional paragraph” relied on by Patent Owner notes that “[a] litter material having a clump strength of ≤ 1.33 using the Standard Drop Method Test (described below) [at] 30 seconds, 1 hour, 12 hours, 24 hours, 36 hours *or* 72 hours after the clump is formed by exposure to a liquid *is removably*

⁶ Relevant case law supports this interpretation of “i.e.” in the specification. *See Edwards Lifesciences LLC v. Cook Inc.*, 582 F.3d, 1322 1334 (Fed. Cir. 2009) (“As the court correctly reasoned, the specification’s use of ‘i.e.’ signals an intent to define the word to which it refers, . . . and that definition was not limited to the embodiment being discussed.”); *Abbott Labs. v. Novopharm Ltd.*, 323 F.3d 1324, 1327–28, 1330 (Fed. Cir. 2003) (holding that the specification’s use of “i.e.” defined the limitation); *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1201 (Fed. Cir. 2013) (finding that reading “beads (i.e., two-dimensions)” as definitional comports with the plain language of the specification as a whole and the inventors clearly expressed intent to differentiate the use of beads from three dimensional culturing”); *see also Rembrandt Wireless Techs., LP v. Samsung Elecs. Co., Ltd.*, 853 F.3d 1370, 1376–77 (Fed. Cir. 2017) (finding the use of “i.e.” definitional in the context of prosecution history statements).

clumpable.” Ex. 1001, 5:28–33 (emphasis added); Prelim. Resp. 17–18 (referring to “definitional paragraph” that includes this language). Use of the disjunctive “or” in that sentence indicates that a litter having the required clump strength at any of the listed time intervals falls within the scope of “removably clumpable.”

Based on the foregoing, we conclude that “removably clumpable” in independent claims 1 and 10 requires, at a minimum, a mixture having “a clump strength of ≤ 1.33 using the Standard Drop Method Test . . . 30 seconds, 1 hour, 12 hours, 24 hours, 36 hours *or* 72 hours after the clump is formed by exposure to a liquid.” Ex. 1001, 5:28–32 (emphasis added).

D. Obviousness Challenge Based on Goss, Winkleman, and House

Petitioner argues that the combination of Goss, Winkleman, and House renders claims 1–17 obvious. Pet. 2, 57–68. Patent Owner raises several arguments against this challenge. See PO Resp. 30–38, 45–48, 53–56. We first provide a brief overview of the prior art, and then address the parties’ arguments.

1. Overview of Goss, Winkleman, and House

Goss discloses a “clumping animal litter” containing up to 60% sodium bentonite and a non-swelling clay filler. Ex. 1005, code (57). Patent Owner is the assignee of Goss, and Goss shares some similar teachings as the ’393 patent. See *id.* at code (73). For example, Goss not only emphasizes the weight percents of sodium bentonite and filler material, but also the “judicious selection of particle size distribution” of each material. *Id.* at code (57), 4:64–5:33 (particle size analysis of sodium bentonite). Goss also discloses examples containing sodium bentonite and a non-swelling clay in various ratios and having various mean particle sizes. *Id.* at 6:39–65.

For each example, Goss discloses a clump strength rating based on a scale of 1 to 5 after conducting a drop test, with 1 indicating a clump that remained substantially intact after the test. *Id.* at 6:6–38. Several test results show a successful clump strength of 1 or 1.3 at 30 seconds and 24 hours after wetting the litter. *See id.*

Winkleman discloses a litter containing a mixture of particles coated with a swelling clay, such as bentonite, and a filler material. Ex. 1003 ¶¶ 11, 21. Winkleman further discloses various materials as preferred fillers, including “biological materials including wood pellets, . . . cellulose, byproducts of wheat (e.g., wheat hulls), byproducts of barley (e.g., barley hulls), byproducts of soy, paper, etc.” *Id.* ¶ 26. According to Winkleman, use of such filler materials helps reduce the weight and density of the resulting litter. *Id.* ¶¶ 22, 26.

House relates to a clumping cat litter comprising certain mixtures of clay and cellulose material. Ex. 1004, code (57), 2:51–54. House states that it seeks “to provide a clumping sorbent having superior sorption capacity and sufficient cohesiveness when wetted with an aqueous liquid, such as urine, to be easily separated from the nonwetted sorbent particles.” *Id.* at 2:66–3:2. According to House, its invention provides sorbents that, “when wetted with urine form[] a mass of sorbed, wetted sorbent that can be scooped out or otherwise removed from the litter box.” *Id.* at 6:43–46. House discloses using between 5% and 70% “cellulosic material” in its litter mixture. *Id.* at 4:54–5:13, 8:1–9.

2. *The Parties’ Arguments*

Petitioner argues that Goss discloses the majority of limitations in independent claims 1 and 10 and that Winkleman and House disclose the

cellulose-containing filler materials. *See* Pet. 57–63. Patent Owner argues that (1) the combination fails to disclose the limitation in claims 1 and 10 requiring “sodium bentonite comprises at least 47% of the total external surface area of the mixture” (the “47% of the total external surface area limitation”); (2) the combination fails to disclose the “removably clumpable” limitation in claims 1 and 10; and (3) Petitioner fails to support its challenge with an adequate reason to combine. *See* PO Resp. 30–38, 45–48, 53–56. We focus on the 47% of the total external surface area limitation because we find it determinative.

Petitioner argues that Goss discloses calcium bentonite as one of the filler materials. *See* Pet. 58–59 (citing Ex. 1005, 3:38–4:5; Ex. 1006 ¶¶ 131–133). For the limitations requiring a filler comprising “one or more cellulose-containing materials” (claims 1 and 10), Petitioner argues that one of ordinary skill in the art “would have understood that granular filler materials comprised of cellulose-containing material” can be used “in place of the non-swelling granular clay filler material in the litter mixture of Goss.” *Id.* at 59 (citing Ex. 1006 ¶ 135). Petitioner then argues that both Winkleman and House disclose a clumping litter that includes sodium bentonite and a number of cellulose-containing fillers for use in conjunction with the sodium bentonite. *Id.* at 59–60 (citing Ex. 1003 ¶¶ 20–21, 26; Ex. 1004, 2:52–62; 4:20–28; 4:54–5:13; Ex. 1006 ¶¶ 56, 134–137).

As to the limitation requiring “sodium bentonite comprises at least 47% of the total external surface area of the mixture,” Petitioner includes the following argument:

Where the cellulosic material of the granular filler materials has a bulk density about the same as that of calcium bentonite (approximately 35.4 lbs/ft³), such as wood pellets

(34.4 lbs/ft³), wood shavings (45.6 lbs/ft³), and cedar fiber (red cedar 36 lbs/ft³ or wood fiber 40), a PHOSITA would have clearly understood that the sodium bentonite would comprise at least 47% of the total surface area of such a mixture of about 40% by weight these cellulosic filler materials and about 60% sodium bentonite by weight, as disclosed in Goss.

Pet. 60 (citing Ex. 1006 ¶ 139). Petitioner also relies on “a comparison of the examples in Goss” to “the examples in the ‘393 patent” that allegedly “provide evidence of close similarity in results when like is compared to like.” *Id.* Petitioner points to Example 6 in the ‘393 patent, which employs a 50%-50% weight ratio between sodium bentonite and calcium bentonite, and particle sizes that result in a sodium bentonite surface area of 54% of the total external surface area. *Id.* at 61. Petitioner contends that Examples G and H of Goss use the same weight ratio and “very similar particle sizes” as Example 6 in the ‘393 patent, “with very similar clump test results.” *Id.* According to Petitioner, “[a]lthough Goss makes no mention of surface area, the fact that the materials, particle sizes and weight ratios are so similar means that the surface areas should likewise be very similar” and that “Goss taught that an effective, removably clumpable litter could be achieved within the same [sodium bentonite] Surface Area above 47% as that claimed in the ‘393 patent.” *Id.* at 61–62.

Patent Owner argues that Petitioner fails to support its conclusions with “objective evidence or any rational inference.” PO Resp. 45. Patent Owner contends that Petitioner’s analysis improperly conflates percent by weight, i.e., the weight ratio, of sodium bentonite, with percent total surface area of sodium bentonite. *Id.* at 45–46 (citing Ex. 2012, 55:4–10). Patent Owner also contends that the total surface area calculation requires more than weight percentages and “also depends on the particle size distribution

of the constituent materials (i.e. sodium bentonite and the cellulose-containing filler material).” *Id.* at 46 (citing Ex. 1001, 16:3–35). According to Patent Owner, neither Petitioner nor its expert “disclose[s] the particle size distribution for sodium bentonite used in the Petition’s Ground 3 obviousness analysis” and Petitioner “fails to cite any particle size distribution for any cellulose filler material disclosed in Winkleman.” *Id.* at 46–47 (citing Pet. 50; Ex. 1003 ¶¶ 26, 55; Ex. 1006 ¶¶ 94–96; Ex. 2012, 58:2–6). Patent Owner also faults Petitioner for using bulk density data from a website without knowing whether the bulk density represents the “loose-fill bulk density.” *Id.* at 47 (citing Pet. 61; Ex. 1006 ¶¶ 138–139; Ex. 2012, 49:12–50:22). As to Petitioner’s reliance on the similarities between Example 6 in the ’393 patent and Examples G and H in Goss, Patent Owner argues that Petitioner improperly relies on “average (mean) particle size of sodium bentonite and calcium bentonite,” which is different than the “particle size distribution” data necessary to calculate the claimed total external surface area. *Id.* at 47–48 (citing Pet. 60–62; Ex. 2013 ¶¶ 89, 93–98, 141).

In its Reply, Petitioner states that it “has now conducted confirmatory calculations and performed confirmatory tests in accordance with the prior art” and that “[t]hese calculations and tests confirm Petitioner and its expert’s stated expectations with respect to the prior art, i.e., that it meets the 47% surface area limitations.” Pet. Reply 16 (citing Ex. 1006 ¶¶ 55–58, 98, 139). With respect to Goss, Petitioner contends that “several” of the Goss examples “meet the 47% surface area limitation.” *Id.* at 17 (citing Ex. 1018). In response to Patent Owner’s argument that the bulk densities of sodium bentonite and calcium bentonite were not known, Petitioner relies on

the declaration of Patent Owner's expert in related district court litigation for bulk density "ranges" of these materials. *Id.* at 17–18 (citing Ex. 1012, 102:14–103:04; Ex. 1015 ¶ 61; Ex. 1019). Using those bulk density ranges and "the particle size distributions set forth in Goss," Petitioner provides a summary of new calculations made by Mr. Raymond its declarant that allegedly show that several Goss examples "have a sodium bentonite surface area that is above 47% and according to the very similar drop test used in Goss, are removably clumpable." *Id.* at 18 (citing Ex. 1018). Petitioner contends that these results were "expected" based on Mr. Raymond's original declaration and "consistent with the teachings of Goss which establishes a relationship between clump strength and the ratio of the mean particle size of calcium bentonite as compared to sodium bentonite." *Id.* at 18–19 (citing Ex. 1005, Fig. 1, 6:38–7:28). According to Petitioner, Goss teaches that having a larger mean particle size for non-swelling clay (calcium bentonite in Goss) compared to the particle size of swelling clay (sodium bentonite) improves clump strength, which equates to a higher surface area of sodium bentonite leading to better clump strength results. *Id.* at 19–20 (citing Ex. 1005, Fig. 1, 6:38–7:28; Ex. 1015 ¶ 63).

Petitioner also explains the tests its expert Mr. Raymond conducted on various litter formulations after our Institution Decision. Pet. Reply 20–22 (citing Ex. 1015 ¶¶ 9–13, 15, 20, 22–24; Ex. 1020). Those tests included a drop test apparatus to determine clumpability of litter formulations created by Mr. Raymond. *See id.* In the tests related to the challenge based on Goss, "Mr. Raymond prepared several formulations that meet the teachings of Goss, substituting a cellulosic filler material (paper) as taught by House and Winkleman for the calcium bentonite taught by Goss." *Id.* at 26 (citing

Ex. 1021). Petitioner contends that tests of certain litter formulations using paper balls as filler showed that the 47% surface area limitation and removably clumpable limitations were met for those litters. *Id.* at 26–27 (citing Ex. 1015 ¶¶ 34–36, 40; Ex. 1021).

In its Sur-reply, Patent Owner argues that Petitioner’s Reply “improperly injected new issues, new prior art, new evidence, and new expert testimony that should have been provided in the Petition.” PO Sur-reply 1. Patent Owner contends that Petitioner’s expert prepared and tested nineteen sample litters and that “Petitioner’s new evidence exceeds the proper scope of a reply because Petitioner could have identified the specific litter compositions, provided samples, test data, and surface area calculations in the Petition.” *Id.* at 1–2 (citing Pet. Reply 3, 20–27). Patent Owner further contends that Petitioner’s approach “runs afoul of the statutory requirement that the petition must identify” the grounds for the challenge to each claim and that Petitioner’s “new evidence changed Petitioner’s unpatentability positions and unfairly denied Patent Owner an opportunity to rebut the new sample and test data with expert testimony.” *Id.* at 2–3; *see also id.* at 4–11 (arguing that Petitioner’s Reply introduces new evidence, new issues, and new theories). As to the substance of Petitioner’s new evidence, Patent Owner argues that Petitioner fails to establish that the samples it tested are found in the prior art and instead relies on improper hindsight, with the ’393 patent as a roadmap, when creating the samples. *Id.* at 11–15. Patent Owner also contends that (1) Petitioner fails to provide a motivation to replace the calcium bentonite of Goss with paper balls, “which is not disclosed in Winkleman or House,” and (2) Petitioner fails to explain “why a PHOSITA would replace Goss’s sodium bentonite with a different

sodium bentonite that has a different particle size distribution and significantly larger mean particle size.” *Id.* at 17 (citing Pet. Reply 26; Pet. 62; Ex. 1020, 1).

3. Discussion

a. *Petitioner’s Arguments and Evidence in the Petition Addressing the 47% of the Total External Surface Area Limitation*

We first address whether consideration of the Petition alone shows that Petitioner carried its burden to establish that the prior art discloses the 47% of the total external surface area limitation, before turning to the allegedly improper new arguments and evidence Petitioner submits in connection with its Reply.⁷ As noted above, the Petition sets forth two rationales to support its argument that the combination of Goss with the cellulose fillers taught in Winkelman and House would meet the 47% of the total external surface area limitation. *See* Pet. 60–62. First, Petitioner argues that because the wood pellets, wood shavings, and cedar fiber cellulosic filler materials each “ha[ve] a bulk density about the same as that of calcium bentonite,” “a PHOSITA would have clearly understood that the sodium bentonite would comprise at least 47% of the total surface area of such a mixture of about 40% by weight these cellulosic filler materials and about 60% sodium bentonite by weight, as disclosed in Goss.” *Id.* at 60

⁷ In our Institution Decision, we found that Petitioner met its burden to establish a reasonable likelihood of prevailing with respect to at least one claim and ground, based on the record at that time, which included “currently un rebutted declarant support.” *See* Inst. Dec. 19–20; *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (“[At the institution stage], the Board is considering the matter preliminarily without the benefit of a full record. The Board is free to change its view of the merits after further development of the record, and *should do so* if convinced its initial inclinations were wrong.”).

(citing Ex. 1006 ¶ 139). The cited testimony from Mr. Raymond repeats this same argument and adds a citation to an internet source for the bulk density data used in the Petition. *See* Ex. 1006 ¶ 139 n.6 (citing <https://hapman.com/news-and-knowledge/bulk-material-density-guide/>).

We interpret this portion of the Petition as arguing that the proposed combination of Goss with Winkleman or House would inherently meet the 47% of the total external surface area limitation once the cellulose-containing fillers (wood pellets, wood shavings, or cedar fiber) are used in combination with the sodium bentonite of Goss. *See* Pet. 60. The argument does not allude to obviousness or any alternation of the prior art, and uses language such as “the sodium bentonite *would comprise* at least 47% of the total surface area,” which suggests an inherency argument. *See id.* (emphasis added). Petitioner’s counsel also confirmed at the oral hearing that the Petition sets forth an inherency argument when addressing the 47% of the total external surface area limitation. *See* Tr. 14:10–26, 19:15–21.

Based on our review of the Petition in view of the full trial record, we do not view the information provided in the Petition as sufficient to discern how the replacement of the Goss filler material (calcium bentonite) with the cellulose-containing fillers identified in the Petition would inherently, or necessarily, result in a litter that satisfies the 47% of the total external surface area limitation. *See* Pet. 60.

To establish inherency, the extrinsic evidence “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.

In re Robertson, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted).

The parties disagree as to whether the specific method of calculating surface area percent set forth in the '393 patent specification must be followed precisely,⁸ but Petitioner does not dispute that some particle size information related to both the sodium bentonite and the cellulose-containing filler material must be known to calculate their relative surface area percents within the litter formulation. *See* Ex. 1001, 16:14–39 (setting forth method of determining the percent surface area in a litter formulation); Pet. Reply 21 n.6 (“The particle size distribution and surface area calculations for each sample are provided in Ex. 1020, Raymond 2d Dec. at ¶ 15.”); Ex. 1020 (listing particle sizes for cellulose-containing filler materials for use in Petitioner’s calculations in Reply); Ex. 1021 (providing particle size ranges for sodium bentonite and cellulose-containing fillers for use in Petitioner’s calculations in Reply); PO Resp. 46–47 (arguing that the “total external surface area also depends on the particle size distribution of the constituent materials” and neither Petitioner nor Mr. Raymond provides the required information (citing Ex. 1001, 16:3–35; Ex. 1003 ¶¶ 26, 55; Ex. 1006 ¶¶ 94–96; Ex. 2012, 58:2–6)).

Although Mr. Raymond opines that “a PHOSITA would have clearly understood” that the combination satisfies the limitation, his opinion lacks adequate explanation to support his conclusion. *See* Ex. 1006 ¶ 139.

⁸ Patent Owner contends that in order to perform the calculation necessary to determine compliance with the 47% of the total external surface area limitation, the “loose fill bulk density” and “particle size distributions” (not mere average particle sizes) must be known. *See* PO Resp. 6. Petitioner disagrees, but attempted to follow the method set forth in the '393 patent in its argument and evidence filed in connection with its Reply. *See* Tr. 8:15–9:8.

Petitioner does not meet its burden to show the combination teaches a limitation by simply stating that a PHOSITA would recognize that the limitation would be met, without explaining how or providing the data necessary to test the assertion. Because neither the Petition nor the declaration of Mr. Raymond identifies any particle sizes for the cellulose-containing filler material it relies on or any method of calculating the total surface area of the litter formulation, without that information, Petitioner fails to show that the proposed combination would have inherently, or necessarily, met the 47% of the total external surface area limitation.

We next address Petitioner's argument that the alleged similarity between Examples G and H in Goss and Example 6 of the '393 patent supports its argument as to the 47% of the total external surface area limitation. *See* Pet. 60–62. All of the examples in question address litter formulations that include sodium bentonite and a calcium bentonite filler material, with a 50-50 weight ratio between the two components. *See id.*

According to Petitioner, the sodium bentonite and calcium bentonite particle sizes in Examples G and H in Goss are “very similar” to the particle sizes for the same litter components in Example 6 of the '393 patent. *See* Pet. 61–62. Petitioner admits that “Goss makes no mention of surface area,” but argues that based on the similarities between Goss and the '393 patent Example 6, “the surface areas *should* likewise be very similar.” *Id.* at 61 (emphasis added).⁹ These arguments fail to support Petitioner's position

⁹ Mr. Raymond also briefly addressed this aspect of Goss in his declaration. *See* Ex. 1006 ¶ 139 (“PHOSITA would have understood that the particle size and amount or weight percent of sodium bentonite in such a mixture of sodium bentonite and calcium bentonite of Goss is directly related to the total external surface area of the sodium bentonite in the mixture. This is

that the proposed combination meets the 47% of the total external surface area limitation because the *claimed* composition requires sodium bentonite and a *cellulose-containing* filler material. *See id.* at 59 (addressing limitation requiring filler materials that comprise one or more “cellulose-containing materials”); Ex. 1001, 49:45–46. At most, the similarity between Goss Examples G and H with Example 6 of the ’393 patent may support an inference that Goss discloses sodium bentonite/*calcium bentonite* litter formulations that have enough sodium bentonite to exceed the 47% of the total external surface area of the formulation. *See* Pet. 59. That evidence does not, however, establish the percent surface area of sodium bentonite in the proposed combination that employs a sodium bentonite/*cellulose-containing material* litter formulation, as required by the challenged claims. *See id.* at 60. This portion of the Petition again fails to refer to any particle size for the cellulose-containing material, or a method of calculating the total surface area of the litter formulation.

At oral argument, counsel for Petitioner appeared to agree that the Petition’s reference to bulk density and weight percentages of the components would be insufficient to perform a surface area calculation using any method. *See* Tr. 13:10–12 ([Question:] “So, just looking at bulk density and the weight percentages, that wouldn’t get you to a surface area calculation under any method, would it? [Answer from Petitioner’s counsel]: No.”). Petitioner instead argued that Goss teaches using a “ratio of the

outlined in Examples G and H of Goss as summarized on pages 60–61 of the Petition.”). Petitioner did not cite to this aspect of the declaration in its argument based on Goss, and this testimony does not add anything material to the argument, such as the particle size of any cellulose-containing material. *See* Pet. 60–62.

larger calcium bentonite particles to smaller sodium bentonite particles [to produce better clumps” and that this teaching is “inherent in Mr. Raymond’s statements.” *Id.* at 13:12–19. Neither the Petition nor Mr. Raymond’s cited testimony references or relies on an interpretation of Goss to the effect that it teaches certain ratios of calcium bentonite particles to smaller sodium bentonite particles to produce better clumping. *See* Pet. 60–62; Ex. 1006 ¶ 139. Petitioner did not raise this argument until it filed its Reply, and Mr. Raymond did not make the argument until he filed his second declaration in support of the Reply. *See* Pet. Reply 18–20; Ex. 1015 ¶ 63. More importantly, even if alleged in the Petition with support from Mr. Raymond, the alleged Goss teaching would not supply the missing particle size information related to the cellulose-containing filler material that would enable the calculation of the claimed surface area.

Neither of Petitioner’s arguments in the Petition, whether viewed as separate arguments or together as part of a single argument, provides the particle size information necessary to determine the external surface area of the cellulose-containing filler. Without that surface area information, the total external surface area of the formulation and the surface area percent of sodium bentonite in the formulation cannot be calculated. Accordingly, the Petition fails to provide sufficient information to establish that the proposed combination of cellulose-containing filler material with Goss’s sodium bentonite would inherently, or necessarily, result in a composition that satisfies the 47% of the total external surface area limitation.

b. Petitioner’s Arguments and Evidence in its Reply Addressing the 47% of the Total External Surface Area Limitation

We next address whether we can consider the new arguments and evidence presented in connection with Petitioner’s Reply. Petitioner argues

that its new argument and evidence merely confirm the arguments in the Petition, while Patent Owner argues that the new arguments and evidence are improper and that we should not consider them. *See* Pet. Reply 16 (“Petitioner has now conducted confirmatory calculations and performed confirmatory tests in accordance with the prior art.”); PO Sur-reply 4 (arguing that Petitioner’s “Reply introduced wholesale new evidence, new prior art, and new arguments” in violation of governing law and the Board’s rules).

“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’”

Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd., 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)). Our rules also state that a “reply may only respond to arguments raised in the corresponding opposition or patent owner response.” 37 C.F.R. § 42.23(b); *see also* PTAB Consolidated Patent Trial Practice Guide (Nov. 21, 2019), available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>, 73

(“Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability.”). Because of the governing statute, rule, and case law, “an IPR petitioner may not raise in reply ‘an entirely new rationale’ for why a claim would have been obvious.” *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330–31 (Fed. Cir. 2019); *see also* *Intelligent Bio-Systems*, 821 F.3d at 1369–70 (concluding that reply brief and accompanying declaration exceeded the proper scope of reply due to introduction of new theories and reliance on new evidence); *Wasica Fin. GmbH v. Continental*

Auto. Sys., Inc., 853 F.3d 1272, 1286–87 (Fed. Cir. 2017) (holding that the petitioner improperly shifted its position away from that in the petition by relying on a different portion of a prior art reference and proposed modification).

In other situations, “a reply may be proper if it is responsive and simply expands on previously raised arguments.” *Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1383–84 (Fed. Cir. 2023) (summarizing cases). Accordingly, “there is no blanket prohibition against the introduction of new evidence during an IPR.” *Id.* at 1384. In some situations, for example, a reply may permissibly expand upon previously-made arguments in the petition without amounting to the introduction of a new rationale and without citing new evidence. *See Ericsson Inc. v. Intellectual Ventures I LLC*, 901 F.3d 1374, 1381 (Fed. Cir. 2018).

Here, Petitioner introduces new theories and new evidence as part of its Reply that depart significantly from the arguments and evidence in the Petition. The Petition’s inherency analysis relies on three cellulose-containing filler materials (wood pellets, wood shavings, and cedar fiber) having specific bulk densities similar to the bulk density of calcium bentonite. *See* Pet. 60. As noted above, the Petition lacks critical particle size information as to those filler materials that would enable one to determine whether the proposed combination inherently discloses the 47% of the total external surface area limitation. Petitioner’s Reply, however, does not attempt to supply the particle size for the cellulose-containing filler materials identified in the Petition (wood pellets, wood shavings, and cedar fiber), and largely ignores those materials. *See* Pet. Reply 16–22, 26–27. Instead, Petitioner’s Reply relies on surface area calculations and test data

generated from litter formulations beyond those described in the prior art relied on in the Petition. *See* Pet. Reply 17–27; Ex. 1015 ¶¶ 9–53. For this challenge based on Goss, Winkleman, and House, Petitioner’s Reply relies on a combination of sodium bentonite and paper balls, which are not referenced in the Petition with respect to the 47% of the total external surface area limitation. *See* Pet. 60–62; Pet. Reply 26–27 (citing Ex. 1015 ¶¶ 34–36, 40; Ex. 1021).

Petitioner also relies on voluminous new evidence as part of its Reply arguments, which includes data and calculations that go well beyond anything set forth in the Petition. *See* Pet. Reply 17–27; Ex. 1015 ¶¶ 9–53. For example, Mr. Raymond created new litter formulations using barley, corncob, paper balls, and oat hulls as the cellulose-containing filler material. *See* Pet. Reply 21–22; Ex. 1015 ¶¶ 11, 15. For the challenge based on Goss, Winkleman, and House we address here, Petitioner relies on various types of paper balls, including reliance on particle size data for the paper balls that Mr. Raymond used to calculate the percent surface area of sodium bentonite. *See* Pet. Reply 26; Ex. 1020, 2; Ex. 1021, 16.¹⁰ According to Mr. Raymond, he calculated the surface area of the sodium bentonite and filler materials used in the formulations he tested, and included a “summary of the relevant surface area calculations” as Exhibit 1020. *See* Ex. 1015 ¶ 15. Exhibit 1020 appears to show bulk density and particle size data for a number of materials, including the “Paper Balls” that Petitioner relies on for the first time in its Reply. *See* Ex. 1020, 2; Pet. Reply 26. Exhibit 1020 does not cite

¹⁰ Petitioner did not provide page numbers on Exhibits 1020 or 1021 as required by our rules, and we reference page numbers by counting pages from the beginning of the exhibits.

to a source for the data used in the surface area calculations, and Mr. Raymond only states that he “procured a variety of other filler materials, including corncob granules, Biodac paper granules, ground barley, and oat hulls,” without identifying from where he procured the materials. Ex. 1020, 2; Ex. 1015 ¶ 11. Based on our review of the record, and the lack of explanation from Petitioner, Petitioner and its expert Mr. Raymond rely on data that differs from that relied on in the Petition and was not even of record until Petitioner filed its Reply and related exhibits.

Petitioner attempts to cast its reliance on paper balls as consistent with the Petition, which notes that Winkleman and House disclose “paper” generally in a long list of potential cellulose-containing filler materials. *See* Pet. Reply 26 (“Mr. Raymond prepared several formulations that meet the teachings of Goss, substituting a cellulosic filler material (paper) as taught by House and Winkleman for the calcium bentonite taught by Goss.”); Pet. 59–60. The Petition, however, does not reference “paper” much less the “Biodac paper granules” relied on in the Reply in the argument addressing the 47% of the total external surface area limitation. *See* Pet. 60–62; Ex. 1015 ¶ 11. In addition, Mr. Raymond’s second declaration and related Reply exhibits do not cite to Winkleman or House as disclosing the paper balls relied on in the Reply and accompanying declaration. *See* Ex. 1015 ¶¶ 33–42; Ex. 1020, 2; Ex. 1021, 16 (referencing “Paper Balls 53-47,” “Paper Balls 53-45,” and “Paper Balls 60-40” without citing Winkleman or House as disclosing the “Paper Balls”). Based on the foregoing, Petitioner’s implicit argument that its Reply and related exhibits merely expand on the “paper” referenced generally in Winkleman and House falls flat. The Biodac paper granules, related data, surface area calculations, and testing of

the litter formulation including the material were all new and not of record with the filing of the Petition.

In addition to the new nature of the theories and evidence relied on, Petitioner offers no reason why it could not have included all of this argument and evidence with the Petition, and does not attempt to argue that the extensive new evidence and argument is merely responsive to Patent Owner's Response or our Institution Decision.¹¹ *See* Pet. Reply 16, 26–27; Ex. 2020, 8:4–9:22 (Mr. Raymond testifying that lack of time was the reason he did not submit the evidence and testing used in the Reply with the Petition), 18:1–9 (Mr. Raymond testifying that “[t]here was no reason that I’m aware of” that he could not have included the total external surface area calculations from the Goss patent with his first declaration submitted with the Petition).

Based on our review of the record, we agree with Patent Owner that Petitioner's argument and evidence submitted in connection with its Reply, at least as to the new data, calculations, and testing, crosses the line from permissible responsive argument into impermissible new argument and evidence. *See* PO Sur-reply 4–11. The facts here more closely resemble

¹¹ Petitioner attempts to cast its new argument and evidence as “in response to the Board’s request for additional evidence relating to prior art mixtures.” Pet. Reply 20. We made no request for additional evidence such as that Petitioner relies on in its Reply and associated materials. In our Institution Decision, as to the Goss-based challenge, we actually found a reasonable likelihood of prevailing based on the record at that time, including unrebutted declarant testimony. Inst. Dec. 19–20. While we also noted that “Petitioner’s analysis may have been more persuasive if it also included representative calculations of the relative surface areas,” that does not excuse Petitioner’s reliance on improperly new argument and evidence that go far beyond the Petition and the record evidence. *Id.* at 21.

cases determining that certain reply arguments and evidence are impermissibly new. *See, e.g., Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367–68 (Fed. Cir. 2015) (determining that the Board did not err in rejecting reliance, in the reply, on a different portion of the prior art than the portion cited in the petition).

We also note the prejudice to Patent Owner that would result if we consider the new arguments and evidence in Petitioner’s Reply. At the time Patent Owner filed its Response and related declaration of Dr. Johnston, Patent Owner had no notice that Petitioner would rely on such arguments and evidence, and no ability or reason to address the arguments as part of its Response. Patent Owner was not allowed to submit a rebuttal declaration with its Sur-reply, which would have been especially valuable in this case when attempting to rebut voluminous new calculations and testing data in Mr. Raymond’s second declaration. 37 C.F.R. § 42.23(b) (sur-reply “may not be accompanied by new evidence”). As counsel for Patent Owner pointed out at the oral hearing, if it had the opportunity, it would have presented a rebuttal declaration addressing the new arguments and evidence Petitioner relies on in its Reply, and conducted its own testing to verify or undermine Mr. Raymond’s test results. *See* Tr. 76:2–19. The inability of Patent Owner to address Mr. Raymond’s extensive new material in his second declaration with its own rebuttal declaration supports our decision to not consider the merits of Petitioner’s new arguments and evidence accompanied with its Reply.

Based on the foregoing, we determine that the Petition fails to establish that the combination of Goss, Winkleman, and House satisfies the 47% of the total external surface area limitation, and we do not consider the

new arguments and evidence Petitioner submits on this issue in connection with its Reply.

c. Petitioner's Remaining Arguments

Petitioner makes two additional general arguments that arguably apply to its Goss-based challenge. First, Petitioner argues that we should treat the 47% of the total external surface area limitation as *not* a “result effective variable.” *See* Pet. 8–9, 26. In Petitioner’s view, because the ’393 patent shows that the 47% surface area does not amount to a “magic number” that reliably draws a line between litter formulations that are removably clumpable and those that are not, there is no predictable correlation between surface area and clumpability. *See id.* at 8–9; *see also* PO Resp. 48–53 (arguing against Petitioner’s argument as it applies to the Hughes-based challenge). While we generally agree with Petitioner that the ’393 patent specification fails to show the criticality of the 47% limitation for the claimed compositions,¹² Petitioner fails to show how this fact supports its arguments here. First, Petitioner appears to tie its result effective variable argument to the Hughes-based challenge, but not to this Goss-based challenge. *See* Pet. 33–34, 36–41. Second, Petitioner does not and could not argue that its result effect variable argument absolves Petitioner of the burden of showing that the combination of Goss, Winkleman, and House discloses the 47% of the total external surface area limitation, which it failed

¹² We noted in our Institution Decision that “all of the examples that employ a mixture of sodium bentonite and a cellulose-containing filler as required by the claims produce results that meet the ‘removably clumpable’ definition,” including “examples that have a surface area less than the supposedly critical 47% level.” Inst. Dec. 24–25.

to do for the reasons discussed above. Accordingly, Petitioner's result effective variable argument does not aid it here.

Petitioner also addressed the upper end of the claimed range that is part of the 47% of the total external surface area limitation, which covers compositions having up to 95% surface area of sodium bentonite. Pet. Reply 29–30. In our Institution Decision, we asked the parties to address the issue because the upper end may encompass prior art mixtures discussed in the '393 patent specification and Goss. Inst. Dec. 26. Petitioner argues that “in the early 1990s it was not uncommon for clumping litter formulations to have sodium bentonite in weight percentages up to and in excess of 90%.” Pet. Reply 29 (citing Ex. 1012, 164:17–24; Ex. 1015 ¶ 64; Ex. 1022). Patent Owner argues that Petitioner improperly relies on a new prior art reference (Ex. 1022) in its Reply addressing this issue, and that the Board cannot rely on new prior art and a new ground at this point. PO Resp. 8. We agree with Patent Owner that Petitioner's argument and evidence cannot be treated as a new challenge to the claims or play a part in finding a claim unpatentable. We merely sought input on the issue because of the apparent breadth of the claims and the lack of any discussion of the upper end of the claimed range in the parties' pre-institution filings.

d. Conclusion

Based on all of the arguments and evidence properly before us, which do not include the new arguments and evidence in Petitioner's Reply materials we identify above, we determine that Petitioner has not established by a preponderance of the evidence that the combination of Goss, Winkleman, and House satisfies the 47% of the total external surface area limitation. Accordingly, Petitioner has not established by a preponderance

of the evidence that the combination of Goss, Winkleman, and House renders independent claims 1 or 10 unpatentable as obvious. For the same reasons, we determine that none the challenged claims that depend from those claims 1 and 10, i.e, dependent claims 2–9 and 11–17, would have been obvious based on the combination of Goss, Winkleman, and House.

E. Remaining Obviousness Challenges

Petitioner challenges claims 1–17 based on Hughes and Winkleman as well as House and Winkleman. *See* Pet. 2, 33–57. Patent Owner raises several arguments against these challenges. *See* PO Resp. 26–30, 34–45, 48–56. We first provide a brief overview of Hughes, and then address the parties’ arguments.

1. Overview of Hughes

Hughes discloses a composition for absorbing animal dross comprising a mixture of a water-swellaable sodium bentonite clay and calcium bentonite. Ex. 1002, code (57). The composition absorbs animal dross into a sufficiently large, stable mass that can be physically separated from unsoiled and unwetted material. *Id.* at 4:53–61; 6:1–21. Hughes also states that “cellulose-based materials” may be used in the composition as long as they do not interfere with the ability of the sodium bentonite to absorb liquid and agglomerate into a removable mass. *See id.* at 9:60–10:2. Where the composition includes cellulose-based materials, Hughes discloses that the mixture contains at least 65% water-swellaable sodium bentonite clay by weight. *Id.* at 9:50–10:6.

2. The Parties’ Arguments and Our Institution Decision

We focus on the removably clumpable limitation in independent claims 1 and 10 in our analysis, and therefore focus on that aspect of the

parties' arguments. For these challenges, Petitioner relies on Hughes, Winkleman, and House as disclosing the “removably clumpable” limitation. *See* Pet. 42, 52. For example, in the challenge based on Hughes and Winkleman, Petitioner argues that the “litter box absorbent mixture in Hughes is removably clumpable” and that “Winkleman also teaches removable clumping.” *Id.* at 42 (citing Ex. 1002, 4:48–61; 6:53–67; 7:1–51; 9:19–49; 9:60–67; 10:1–6; figure; Ex. 1003 ¶¶ 21, 42, 43, 52; Ex. 1006 ¶¶ 64–66). In the challenge based on House and Winkleman, Petitioner argues that “House discloses that the mixture is removably clumpable as it ‘has sufficient cohesiveness for removal of the wetted sorbent from the nonwetted sorbent particles’” and that “in a cat litter box, the sorbent when wetted with urine forms a mass of sorbed, wetted sorbent that can be scooped out or otherwise removed from the litter box.” *Id.* at 52 (citing Ex. 1004, 6:38–46, claims 4, 10, 14, code (57); Ex. 1006 ¶¶ 103–105).

In our Institution Decision, we adopted Patent Owner’s proposed construction for “removably clumpable” based on the definition provided in the ’393 patent specification, which requires, among other things, that litter material have a clump strength of ≤ 1.33 using the Standard Drop Method Test. *Inst. Dec.* 10–13. Because these challenges that rely Hughes, Winkleman, and House for the “removably clumpable” limitation did not address the proper claim construction that we adopted, we found Petitioner’s argument and evidence lacking. *Id.* at 23. We noted that Petitioner appeared to apply its own proffered construction of “removably clumpable” in its analysis, which we declined to adopt. *Id.* We also stated that “[a]lthough the issue may be explored further at trial, Petitioner will need to supply additional evidence and argument in order to establish that any of

these references disclose the ‘removably clumpable’ limitation as properly construed.” *Id.*

In its Patent Owner Response, Patent Owner pointed out that the Petition fails to cite to any portion of Hughes, House, or Winkleman that discloses clump strength data using the Standard Drop Method Test described in the ’393 patent specification. PO Resp. 26–28. Patent Owner also argues that Petitioner fails to “present any evidence or explain how Hughes, House or Winkleman’s references to ‘clumping cat litter’ inherently disclose a litter having a clump strength of ≤ 1.33 using the Standard Drop Method Test.” *Id.* at 29–30.

In its Reply, Petitioner submits new test data that allegedly show how the prior art litter formulations satisfy the “removably clumpable” limitation. *See* Pet. Reply 20–26. Petitioner argues that “Mr. Raymond prepared several formulations that meet the teachings of House in view of Winkleman.” *Id.* at 22 (citing Ex. 1021). Petitioner contends that the tests demonstrate that the samples are “all removably clumpable.” *Id.* at 23. Petitioner also argues that “Mr. Raymond prepared several formulations that meet the teachings of Hughes in view of Winkleman where the litter box absorbent composition (which includes water swellable bentonite clay (e.g., sodium bentonite)) also includes cellulose-based materials (i.e., corncob and paper) as taught by Winkleman.” *Id.* at 24 (citing Ex. 1021). According to Petitioner, these test results also show that all of the samples are “removably clumpable.” *Id.* at 25.

In its Sur-reply, Patent Owner argues that Petitioner improperly relies on new evidence and arguments that should have been included in the Petition. *See* PO Sur-reply 4–5. Patent Owner contends that Petitioner’s

“Reply improperly relies on new clump strength evidence derived from samples created after the filing of the petition to backfill the missing clump strength evidence not disclosed in Hughes, House, Winkleman, and Goss.” *Id.* at 5 (emphasis omitted) (citing Ex. 2020, 7:3–14). Patent Owner also contends that Petitioner’s Reply “relies on a series of new samples made from a specific sodium bentonite and specific cellulosic containing materials, with each component having specific weight percentages and specific particle size distributions,” in contrast to the Petition, which did not cite to any of these specific combinations. *See id.* at 6–7 (citing Pet. Reply 21–27).

3. Discussion

As we noted in our Institution Decision, once we adopted Patent Owner’s proposed construction for “removably clumpable,” Petitioner had no argument or evidence in the Petition addressing that construction in the context of Hughes, Winkleman, or House, the three references Petitioner relies on its challenges based on the combination of Hughes and Winkleman and the combination of House and Winkleman. *See* Inst. Dec. 23; Pet. 42, 52. In its Reply, Petitioner does not attempt to rely on the same portions of these references relied on in the Petition and argue that they also meet the narrower construction of “removably clumpable” that governs the case. *See* Pet. Reply 20–26. Accordingly, based on our review of the record, the arguments and evidence in the Petition fail to establish that either Hughes and Winkleman, or House and Winkleman, discloses the removably clumpable limitation.

Rather than attempt to argue that the evidence contained in the Petition supports its argument that the prior art discloses the removably

clumpable limitation, in its Reply, Petitioner relies on new argument and evidence. *See* Pet. Reply 20–26. For the same reasons discussed above in the context of the challenge based on Goss, the new arguments and evidence go beyond permissible responsive argument and evidence.

First, Petitioner’s Reply arguments introduce new theories because the Petition bases its arguments as to “removably clumpable” on cited excerpts from the references themselves. *See* Pet. 42, 52. In the Reply, on the other hand, Petitioner changes the approach by relying on data and calculations that are not contained in the cited portions of the references relied on in the Petition. *Compare id. with* Pet. Reply 20–26.

Second, as noted above in our previous discussion of Petitioner’s approach in the Reply, Petitioner relies on voluminous new evidence as part of its Reply arguments, which include data and calculations that go well beyond anything set forth in the Petition. *See* Pet. Reply 21–27; Ex. 1015 ¶¶ 9–53. Mr. Raymond created new litter formulations using barley, corncob, paper balls, and oat hulls as the cellulose-containing filler material. *See* Pet. Reply 21–22; Ex. 1015 ¶¶ 11, 15. For the challenges at issue here, Petitioner relies on various types of barley, corncob, and paper balls as filler materials. Pet. Reply 22–26. The Reply relies on particle size data for the fillers that Mr. Raymond used to calculate the percent surface area of sodium bentonite. *See id.*; Ex. 1020, 1–3; Ex. 1021, 1–15. Mr. Raymond states that he included a “summary of the relevant surface area calculations” as Exhibit 1020; yet, Exhibit 1020 does not cite to a source for the data used in the surface area calculations, and Mr. Raymond only states that he “procured a variety of other filler materials, including corncob granules, Biodac paper granules, ground barley, and oat hulls,” without identifying from where he

procured the materials. *See* Ex. 1015 ¶¶ 11, 15; Ex. 1020, 1–3. Mr. Raymond then used the formulations he created to conduct tests to determine whether the formulations met the “removably clumpable” limitation, which Petitioner relies extensively in its Reply. *See* Ex. 1015 ¶¶ 9–53; Pet. Reply 20–27. Based on our review of the record, Petitioner and its expert Mr. Raymond again refer to data that differs from that relied on in the Petition and was not even of record until Petitioner filed its Reply and related exhibits.

Petitioner provides no reason why it could not have made the same arguments, based on the same evidence, in the Petition. *See* Pet. Reply 20–26. Although we adopted a claim construction in our Institution Decision that differed from the construction Petitioner proposed in the Petition, under the particular factual circumstances of this case, that change does not justify the extent of Petitioner’s reliance on new arguments and evidence in its Reply, and Petitioner makes no such claim. *See id.* Our claim construction was not only foreseeable because it was based on an express definition in the specification, it was also foreseen by Petitioner because it noted the definition in the Petition and adequately addressed the construction in its challenge based on Goss. *See* Pet. 4–5 (“According to the ‘393 patent, to meet the requirements of the claims and achieve a mixture that is ‘removably clumpable,’ it must have, ‘a clump strength of 1.33 using the Standard Drop Method Test . . . 30 seconds, 1 hour, 12 hours, 24 hours, 36 hours or 72 hours after the clump is formed by exposure to a liquid.’” (citing Ex. 1001, 5:24–33, 10:52–11:56; Ex. 1006 ¶ 41)), 62–63 (arguing that Goss discloses litters with clump strength less than 1.3 when the clumps are vertically dropped). Accordingly, the claim construction we adopted in the

Institution Decision does not justify Petitioner's reliance on extensive new arguments and evidence in its Reply.

Petitioner also suggests that its submission of new arguments and evidence was at our behest, but that argument also misses the mark. *See* Pet. Reply 20. In our Institution Decision, we noted that because the Petition failed to address the proper claim construction for “removably clumpable,” Petitioner would need to supply additional argument and evidence to establish that any of the references discloses the “removably clumpable” limitation under the proper construction. *See* Inst. Dec. 23. That statement, given the failings of the Petition, did not specify what form the argument and evidence might take or provide Petitioner a blank check to submit whatever new argument and evidence it wished in connection with its Reply. *See id.* Petitioner could have, for example, argued that the existing citations to allegedly removably clumpable litter formulations in the Petition would also meet the construction of “removably clumpable” we adopted in the Institution Decision, potentially with a new declaration in support of that interpretation. Such an approach may have passed muster with our rules and the Federal Circuit guidance on this subject. The approach Petitioner did take, which relies on entirely new data, calculations, and testing that were not of record prior to the filing of the Reply, and certainly could have been presented with the Petition (particularly given the express definition of “removably clumpable” in the specification), goes far beyond the permissible bounds of a reply.

Based on our review of the record, we agree with Patent Owner that Petitioner's argument and evidence submitted in connection with its Reply, at least as to the new data, calculations, and testing related to the “removably

clumpable” limitation at issue in these challenges, crosses the line from permissible responsive argument into impermissible new argument and evidence. *See* PO Sur-reply 4–10.

Based on all of the argument and evidence properly before us, which do not include the new arguments and evidence in Petitioner’s Reply materials, we determine that Petitioner has not established by a preponderance of the evidence that the combination of Hughes and Winkleman, or the combination of House and Winkleman, discloses the “removably clumpable” limitation in claims 1 and 10. Accordingly, Petitioner has not established by a preponderance of the evidence that the combination of Hughes and Winkleman, or House and Winkleman, renders independent claims 1 or 10 unpatentable as obvious. For the same reasons, we determine that none the challenged claims that depend from those claims 1 and 10, dependent claims 2–9 and 11–17, would have been obvious based on the combination of Hughes and Winkleman, or House and Winkleman.

F. Patent Owner’s Motion to Exclude

Patent Owner moves to exclude Exhibit 1019 under 37 C.F.R. § 42.64(c). Paper 25, 1. Exhibit 1019 is an expert report of Patent Owner’s declarant filed in a district court action that Petitioner relied on as part of its Reply. *See id.* Patent Owner argues that Exhibit 1019 is hearsay and not admissible. *Id.* (citing Fed. R. Evid. 802). Petitioner argues that Exhibit 1019 falls under the residual hearsay exception, while Patent Owner disagrees. *See* Paper 26, 1–2; Paper 27, 1–4.

We need not reach the merits of Patent Owner’s Motion to Exclude because exclusion would not impact the outcome of this Decision. As discussed above, we determine that Petitioner failed to establish that the

combination of Goss, Winkleman, and House renders any challenged claims obvious. We also determine that Petitioner relies on improper new argument and evidence as part of its Reply materials. While we did not specifically address Exhibit 1019 in that discussion, even if we considered the merits of Petitioner's argument that relies on Exhibit 1019, it would not change the outcome of our analysis. Petitioner relies on Exhibit 1019 for bulk density data, and even if Petitioner could rely on that data, that data would not provide sufficient information necessary to establish that the combination discloses the 47% of the total external surface area limitation. *See* Pet. Reply 17. Accordingly, we dismiss Patent Owner's Motion to Exclude as moot.

CONCLUSION

In summary:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–17	103	Hughes, Winkleman		1–17
1–17	103	House, Winkleman		1–17
1–17	103	Goss, Winkleman, House		1–17
Overall Outcome				1–17

ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Patent Owner's Motion to Exclude is *dismissed* as moot;

FURTHER ORDERED that no challenged claim of the '393 patent is determined to be unpatentable; and

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

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Patent 9,439,393 B1

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