

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COLGATE-PALMOLIVE COMPANY,
Petitioner,

v.

NOBLE INNOVATIONS NC L.L.C.,
Patent Owner.

IPR2023-01254
Patent 8,881,332 B2

Before RYAN H. FLAX, TIMOTHY G. MAJORS, and
MICHAEL A. VALEK, *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

JUDGMENT
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Noble Innovations NC L.L.C. (“Patent Owner”) is the owner of U.S. Patent 8,881,332 B2 (“the ’332 patent”). Paper 11, 1. On July 26, 2023, Colgate-Palmolive Company (“Petitioner”) filed a Petition for *inter partes* review challenging the patentability of claims 1, 2, and 5–18 of the ’332 patent (claims 3 and 4 are not challenged). Paper 1, 1 (“Pet.”).

On February 1, 2024, we instituted trial in this proceeding. Paper 12 (“Institution Decision” or “DI”).

Subsequently, on May 6, 2024, Patent Owner filed a Response to the Petition, to which Petitioner responded with a Reply on July 29, 2024, which was followed on August 29, 2024, by a Sur-reply from Patent Owner.¹ Papers 21 (“Resp.”), 27 (“Reply”), and 28 (“Sur-reply”).

Oral argument was heard at a final hearing held October 31, 2024, and the transcript thereof is of record. *See* Paper 36 (Hr’g Tr.).

Petitioner bears the burden of proving unpatentability of the challenged claims, and this ultimate burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). To prevail, Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e) (2018); 37 C.F.R. § 42.1(d) (2023). After considering the parties’ arguments

¹ On November 12, 2024, we granted-in-part Petitioner’s Motion to Strike (Paper 29), striking and excluding from the record Exhibits 2014 and 2015, but not striking any portion of Patent Owner’s Sur-reply; instead, we disregard and do not consider any evidence or arguments therein exceeding the proper scope of a sur-reply under 37 C.F.R. § 42.23(b) and as explained in our Consolidated Trial Practice Guide (“CTPG”), 84 Fed. Reg. 64,280 at 73–75 (Nov. 2019). Paper 35.

and supporting evidence, as discussed in detail below, we conclude that Petitioner has proved that the challenged claims of the '332 patent are unpatentable. Our reasoning is discussed below.

A. REAL PARTIES-IN-INTEREST

Petitioner states the real parties-in-interest are “Colgate-Palmolive Company (Petitioner); Walmart Inc. (co-defendant in underlying district court case); and Target Corporation (co-defendant in underlying district court case).” Pet. 1. Patent Owner states, “Noble Innovations,” which we understand to mean Patent Owner, is the real-party-in-interest. Paper 11, 1.

B. RELATED MATTERS

Petitioner states:

As of the filing date of this Petition, the '332 Patent has been asserted in *Noble Innovations NC L.L.C. v. Colgate-Palmolive Company, et al.*, Case No. 8:22-cv-03373-PX (D. Md.) (filed December 30, 2022). Ex. 1005, pp. 2, 7, 10.

The '332 Patent is related to U.S. Application No. 11/840,627 and to U.S. Patent No. 9,808,077. The '332 Patent issued from U.S. Patent No. 12/101,446, which is a continuation-in-part of, and claims priority to, U.S. Application No. 11/840,627. U.S. Patent No. 9,808,077 issued from U.S. Patent Application No. 14/535,442, which was filed as a continuation of the '332 Patent application.

Pet. 1.

Patent Owner states:

As of December 15th, 2023 the '332 patent has been involved in *Noble Innovations v. Colgate-Palmolive Company et al.*, 8:22-cv-03373 (District of Maryland).

The '332 patent issues from application No. 12/101,446. The '332 patent is a continuation in part of US Patent

application No. 11/840,627, which is now abandoned. US Patent 9,808,077 is a continuation of the '332 patent.

Paper 11, 1.

C. THE '332 PATENT AND RELEVANT BACKGROUND

The '332 patent issued on November 11, 2014, from U.S. Application 12/101,446, which was filed on April 11, 2008. Ex. 1001, codes (10), (45), (21), (22). The '332 patent indicates priority to, as a continuation-in-part of, an earlier application (No. 11/840,627, *see* Ex. 1003 (file history, “the '627 application”)) filed on August 17, 2007; this priority date is contested by Petitioner. Ex. 1001, code (63); Pet. 11–18; *see infra* Section II.E.

The '332 patent describes its invention as follows:

A toothbrush includes a brush head having a capsule receiving zone sized to receive an [*sic*] dentrifice capsule, and a plurality of angled bristles adapted to retain the capsule in such zone. Loading of such toothbrush with a capsule may be performed with a dispenser including a toothbrush manipulation element adapted to move a retention structure associated with the brush head, and dispensation element adapted to deliver the capsule into the receiving zone. Such dispenser may include a desiccant material disposed to receive moisture from a capsule storage container. A dispenser may further include a plurality of toothbrush insertion apertures each adapted to receive a portion of a different toothbrush, so as to enable multiple users each having different toothbrushes to use the same dispenser without requiring contact between multiple brushes and single capsule interface surface of the dispenser.

Ex. 1001, Abstract; *cf. id.* at 10:30–12:43 (although the Abstract indicates the invention includes “a dispenser,” no such apparatus is claimed).

A toothbrush as mentioned in the Abstract is illustrated in the '332 patent in most relevant detail at Figure 1, which we reproduce below:

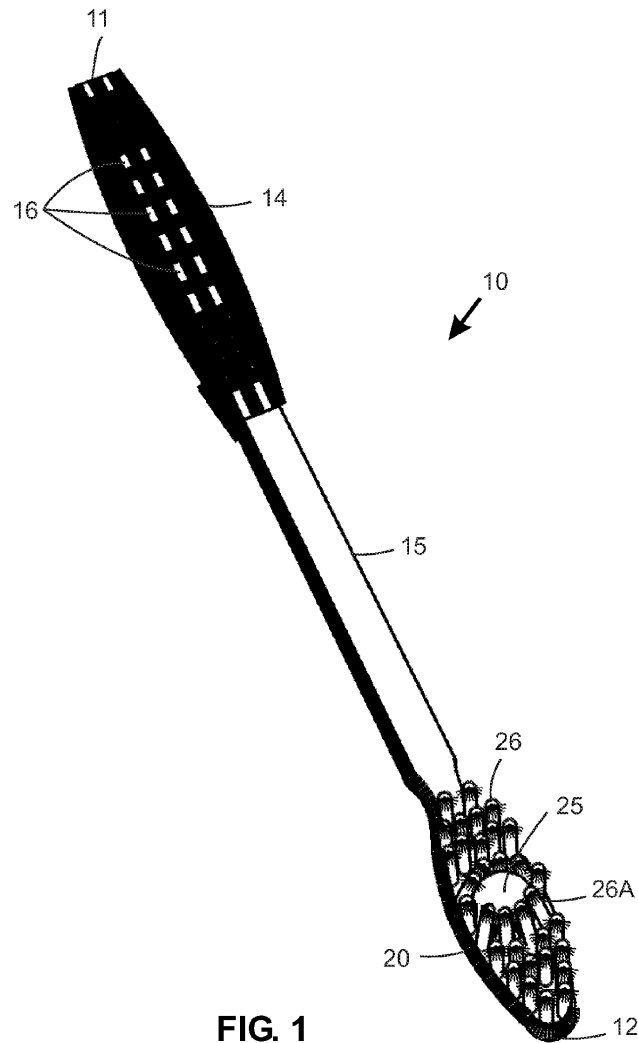


FIG. 1

Id. at Fig. 1. Figure 1 shows a perspective view of toothbrush 10 having handle 14, shaft 15, and brush head 20. *Id.* at 4:57–61. Brush head 20 has capsule receiving zone 25, which “may include a recess,” “within a plurality of angled bristles 26A,” which “retain an oral care capsule (not shown)” in “the capsule receiving zone 25.” *Id.* at 4:62–5:1. “Conventional straight

bristles 26” are also included in the figure. *Id.* at 5:8–9. Regarding angled bristles and capsule receiving zone 25, the ’332 patent describes:

The angled bristles 26A are preferably canted away from vertical in a direction toward the center of the capsule receiving zone 25, so as to retain an oral care capsule (not shown) insertable into the capsule receiving zone 25. The size and shape of the capsule receiving zone 25, and the size, spacing, and angle of the angled bristles 26A, are selected to retain an oral care capsule of a predetermined size and shape. As shown in FIGS. 1, 4, and 5, ten angled bristles 26A are equally spaced around the perimeter of a circular recess (spanning 360 degrees) defining the capsule receiving zone 25.

Id. at 4:65–5:8. To prepare the toothbrush for use, the ’332 patent next describes toothbrush 10 as follows:

In the present embodiment, an oral care capsule is loaded into the toothbrush 10 by spreading the angled bristles 26A apart, and then inserting the capsule past the spread bristles into the oral care capsule receiving zone. In another embodiment to be described in more detail hereinafter, a toothbrush may include a moveable retaining element bounding a capsule receiving zone (e.g., from behind) and permitting an oral care capsule to be loaded without spreading apart bristles of the toothbrush.

Id. at 5:10–19.

The ’332 patent states that oral care capsules, such as described as used with toothbrush 10, “[we]re known,” and took a variety of forms (e.g., beads and capsules) and shapes, and were used with conventional toothbrushes “in the normal manner.” *Id.* at 1:51–2:23. The ’332 patent describes that such prior art oral care capsules were manually manipulated by the user, e.g., to be broken open and dispensed onto a toothbrush or inserted into the mouth. *Id.*

The '332 patent concludes with eighteen claims, of which claims 1 and 10 are independent claims. *Id.* at 10:30–12:43. Claims 1 and 10 are reproduced below, with sub-numbering added, as used by Petitioner:

[1.0] 1. A toothbrush comprising a brush head that includes:

[1.1] a front surface;

[1.2] a back surface;

[1.3] a plurality of vertical bristles extending upward from the front surface;

[1.4] a capsule receiving zone sized to receive an oral care capsule, [1.5] the capsule receiving zone including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule inserted past the vertical bristles; and

[1.6] at least one pair of angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone, [1.7] wherein each pair of the at least one pair [of] angled capsule retaining elements includes a first and a second angled capsule retaining element arranged along diametrically opposing sides of an oral care capsule when present in the capsule receiving zone; and [1.8] wherein at least a portion of each angled capsule retaining element of the at least one pair of capsule retaining elements is arranged to contact the oral care capsule.

Id. at 10:30–50; *see also* Ex. 1007 (claim list).

[10.0] 10. A toothbrush comprising a brush head that includes:

[10.1] a front surface and [10.2] a back surface that opposes the front surface;

[10.3] a plurality of bristles extending upward from the front surface and arranged distal from a center of the front surface;

[10.4] a capsule receiving zone [10.5] including a recess defined in the front surface and arranged to receive at least a portion of an oral care capsule insertable past the bristles into the recess; and

[10.6] at least three angled capsule retaining elements that are elevated above the recess, are configured to retain an oral care capsule in the capsule receiving zone, and are canted away from vertical in a direction toward a center of the capsule receiving zone, [10.7] wherein each angled capsule retaining element of the at least three angled capsule retaining elements is arranged proximate to a perimeter of the capsule receiving zone at a position at least 108 degrees apart from at least one other angled capsule retaining element of the at least three angled capsule retaining elements relative to a center of the capsule receiving zone; and [10.8] wherein at least a portion of each angled capsule retaining element of the at least three angled capsule retaining elements is arranged to contact the oral care capsule.

Ex. 1001, 11:25–12:5; *see also* Ex. 1007 (claim list).

Comparing the quoted claim language above, the two independent claims are similar, but claim 10 requires that there are “at least three” (rather than two) “angled capsule retaining elements,” which are each “at least 108 degrees apart” (rather than diametrically opposing). *See* Ex. 1007 (compare sub-numbered elements of claims 1 and 10).

Independent claim 1 is followed by challenged dependent claims 2, 5–9, 15, and 16, which depend directly or indirectly from claim 1. Ex. 1001, 10:51–11:24, 12:25–32. Similarly, challenged claims 11–14, 17, and 18 depend directly or indirectly from independent claim 10. *Id.* at 12:6–14, 12:33–43. These dependent claims further define the recited toothbrush, its companion oral care capsule, or a method (claims 9 and 14) of loading the oral care capsule on the toothbrush.

D. PETITIONER’S ASSERTED GROUNDS FOR UNPATENTABILITY

Petitioner asserts six grounds for unpatentability of the challenged claims, as follows:

Ground	Claims Challenged	35 U.S.C. § ²	Reference(s)/Basis
1	1, 2, 5–18	103(a)	Wolcott, ³ Davidson, ⁴
2	1, 2, 5–18	103(a)	Wolcott, Davidson, Fitz-Gibbon ⁵
3	1, 2, 5–18	103(a)	Young, ⁶ Davidson
4	1, 2, 5–18	103(a)	Young, Davidson, Fitz-Gibbon
5	1, 5, 7–11, 13–18	103(a)	Sorrentino ⁷
6	1, 2, 5–18	103(a)	Sorrentino, Fitz-Gibbon

Pet. 3. In support of these grounds for unpatentability, Petitioner submits, *inter alia*, the Declaration of Timothy P. Fletcher (Ex. 1008). Patent Owner similarly submits, *inter alia*, the Declaration of Kelly R. Kodama (Ex. 2001) in support of its positions in this proceeding. There is no reasonable dispute that Mr. Fletcher and Mr. Kodama are each competent to testify as to the subject matter of their declaration. *See* Ex. 1008 ¶¶ 8–16, 45, App’x A

² The actual filing date of the ’332 patent is April 11, 2008, which is before the relevant AIA revisions to the Patent Act took effect on March 16, 2013. 35 U.S.C. § 100 (note). Therefore, pre-AIA § 102 and § 103 apply.

³ F.E. Wolcott, US 2,262,982, issued Nov. 18, 1941 (Ex. 1009, “Wolcott”).

⁴ N.J. Davidson, US 2,307,493, issued Jan. 5, 1943 (Ex. 1010, “Davidson”).

⁵ J.J. Fitz-Gibbon, US 1,346,536, issued July 13, 1920 (Ex. 1011, “Fitz-Gibbon”).

⁶ J.D. Young, US 1,995,374, issued Mar. 26, 1935 (Ex. 1012, “Young”).

⁷ Alan Sorrentino et al., US 8,240,937 B2, issued Aug. 14, 2012 (Ex. 1013, “Sorrentino”).

(witness's background, experience, and CV); Ex. 2001 ¶¶ 8–20; Ex. 2002 (witness's CV); Ex. 2003 (witness's expert experience). Mr. Kodama was deposed by Petitioner in this proceeding and that testimony is of record. Ex. 1019. No cross-examination testimony of Mr. Fletcher is of record.

II. DISCUSSION

A. LEGAL STANDARDS

“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 shifts to Patent Owner.⁸ *See Dynamic Drinkware*, 800 F.3d at 1378.

As noted above, all grounds for unpatentability asserted by Petitioner are based on the alleged obviousness of the challenged claims. The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 550 U.S. 398 (2007), reaffirmed the framework for determining obviousness set forth in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). The *KSR* Court summarized the four factual inquiries set forth in *Graham* (383 U.S. at 17–18) that are applied in determining whether a claim is unpatentable as obvious under 35 U.S.C. § 103(a) as follows: (1) determining the scope and content of the prior art; (2) ascertaining the differences between the prior art and the claims at issue;

⁸ Although at times we refer to Patent Owner's arguments as not persuasive, this is in the context of assessing the record and the parties' arguments; we do not shift the ultimate burden from Petitioner.

(3) resolving the level of ordinary skill in the art;⁹ and (4) considering objective evidence indicating obviousness or non-obviousness. *KSR*, 550 U.S. at 406.

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. “[W]hen the question is whether a patent claiming the combination of elements of prior art is obvious,” the answer depends on “whether the improvement is more than the predictable use of prior art elements according to their established functions.” *Id.* at 417.

“[O]bjective indicia of non-obviousness play an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis,” and “may often be the most probative and cogent evidence in the record.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016); *see also Graham*, 383 U.S. at 36 (“[Objective indicia] may also serve to guard against slipping into use of hindsight, and to resist the temptation to read into the prior art the teachings of the invention in issue.” (internal quotation marks and citation omitted)). “In order to accord substantial weight to [objective indicia of non-obviousness, also called] secondary considerations[,] in an obviousness analysis, the evidence of secondary considerations must have a nexus to the claims, *i.e.*, there must be a legally and factually sufficient connection between the evidence and the patented invention.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (citations and internal quotation marks omitted). “The patentee bears the burden of showing that a nexus exists.” *Id.*

⁹ *See infra* Section II.B.

B. ORDINARY LEVEL OF SKILL IN THE ART

Petitioner contends:

A POSITA,^[10] on or before August 17, 2007, or alternatively on or before April 11, 2008, would have had a minimum of a Bachelor's degree in Industrial Design, Mechanical Engineering, or related field and approximately 5 years of professional experience in the field of consumer product design and manufacturing. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.

Pet. 4 (citing Ex. 1008 ¶ 44); *see also* Ex. 1008 ¶¶ 42–45 (Petitioner's witness, Mr. Fletcher, using this same definition in his analysis and testimony).

Patent Owner's briefing refers to the understanding of a person of ordinary skill in the art or POSITA, but Patent Owner neither proposes a definition of the ordinarily skilled artisan nor opposes Petitioner's proposed definition. *See generally* Resp. Patent Owner's witness, Mr. Kodama, testifies that an ordinarily skilled artisan as of the invention date would be defined identically as proposed by Petitioner. Ex. 2001 ¶ 46.

We accept and use Petitioner's proposed and unopposed definition of the ordinarily skilled artisan. It appears that Petitioner's proposed definition comports with the level of skill in the art reflected in the prior art of record and the '332 patent, itself. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) ("the prior art itself [may] reflect[] an appropriate level" as

¹⁰ Petitioner uses the acronym POSITA to reference the person of ordinary skill in the art.

evidence of the ordinary level of skill in the art) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985)).

C. CLAIM CONSTRUCTION

The Board interprets claim terms in an *inter partes* review using the same claim construction standard that is used to construe claims in a civil action in federal district court. 37 C.F.R. § 42.100(b). In construing claims, district courts and the Board here, by default, give claim terms their ordinary and customary meaning, which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc).

When claim terms require express construction, sources for claim interpretation include “the words of the claims themselves, the remainder of the specification, the prosecution history [i.e., the intrinsic evidence], and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art.” *Id.* at 1314 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004)). “[T]he claims themselves [may] provide substantial guidance as to the meaning of particular claim terms.” *Id.* However, the claims “do not stand alone,” but are part of “‘a fully integrated written instrument’ . . . consisting principally of a specification that concludes with the claims,” and, therefore, the claims are “read in view of the specification.” *Id.* at 1315 (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 978–79 (Fed. Cir. 1995) (en banc)). Any special definition for a claim term must be set forth in the specification “with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Without such a special definition, however, limitations may not be read from the

specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’” *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

At institution, and now, the only claim language potentially in dispute as to its meaning was and is “angled capsule retaining elements,” which is recited by or referred to in claims 1, 2, and 5–18. *See* Ex. 1001, 10:30–12:43. In our Institution Decision, we found it unnecessary to expressly construe any claim language because, at that stage in the proceeding, there was no dispute that the “angled capsule retaining elements” limitation *includes angled bristles*, even if the claim term may not be limited to only such a structure (and its equivalents), and we found that the preliminary record supported that *angled bristles* were taught in the prior art. DI 11–12 (citing *Nidec*, 868 F.3d at 1017).

Petitioner asserts that the claim language “angled capsule retaining elements” is a means-plus-function limitation under 35 U.S.C. § 112(6), where the function is “retaining an oral care capsule in a capsule receiving zone,” and the Specification’s corresponding structure is “angled bristles.” Pet. 8–11 (citing Ex. 1001, Abstract, 2:59–61, 2:65–67, 3:20–22, 4:64–5:13, 6:23–24, 6:26–30, 6:34–37, 7:19–23, 7:33–42, 9:61–10:1, 10:5–8, Figs. 1, 4, 5, 6; Ex. 1002, 224; Ex. 1008 ¶¶ 96–97). However, Petitioner also subsequently argues that “[t]he plain meaning of the claims requires only that bristles that retain a capsule be ‘angled’—nothing more,” and, relatedly,

“[i]n Petitioner’s view, the panel should largely adhere to the findings in the institution decision, in the final written decision, including as to claim construction and especially as to grounds one through four.” Reply 3; Hr’g Tr. 5:14–25 (Petitioner arguing that no express claim construction is needed if the claim term “angled capsule retaining element” includes within its scope *angled bristles*).

Patent Owner does not *directly* assert any claim construction position. *See generally* Resp. (there is no section of the Response identified as a claim construction argument). Moreover, during the final hearing, in response to repeated requests from the Panel for clarification on its position on claim construction, Patent Owner indicated it was not arguing for a claim construction here (specifically, not a means-plus-function interpretation) and instead relies on the ordinary and customary meaning of the claim language. Hr’g Tr. 27:16–24, 29:6–17; 35:20–38:21.

Patent Owner does, however, dispute the merits of Petitioner’s challenges, urging that the claim limitation “angled capsule retaining elements” is not taught by the prior art. More specifically, Patent Owner identifies a description in the patent (and preceding related application) it asserts is directed to the “angled capsule retaining elements” as “the oral care capsule is retained [...] preferably also from above by *a plurality of angled bristles*,” and further asserts that there is some required “intent” involved in the angling of bristles inwardly to hold an oral care capsule, and that such *intent* requires an angled *tuft* of bristles rather than individual bristles angling out from an otherwise non-angled tuft. *See* Resp. 5–6 (citing

Ex. 1003, 23;¹¹ Ex. 2001 ¶¶ 57–58) (emphasis changed; alteration in original); *see generally* Sur-reply. Patent Owner argues that, “[a]s is clear from continuing on in the specification, at 5:5-8, *the reference to bristles* is not to a few random individual bristles, it *is to groups of bristles (tufts)*.” Sur-reply 1–2 (emphasis added); *see also id.* at 1–12.

Based on the record as a whole, we understand Patent Owner’s position to be that the claim term “angled capsule retaining elements” should be interpreted to mean *angled bristles* as referenced in the written description, which in turn should be interpreted to mean “an intentionally angled tuft of bristles.” *See id.* at 2–3, 7–9; *see also* Hr’g Tr. 31:11–21, 35:20–38:21 (explaining that the claim term covers “something like [disclosed in prior art reference] Fitz-Gibbon[]”).

We agree with Petitioner that the bristles must be angled and disagree with Patent Owner. As explained above, it remains generally uncontested that the claim language “angled capsule retaining elements” includes within its scope *angled bristles*. This is well supported by the intrinsic record: only one type of *angled* structure is disclosed in the ’332 patent as functioning to retain an oral care capsule on a toothbrush, and that structure is “a plurality of angled bristles adapted to retain an oral care capsule in the capsule receiving zone.”¹² Ex. 1001, 2:57–67, 4:62–5:13. The ’332 patent explains

¹¹ Patent Owner actually cites “‘627 patent app” at paragraph 36,” without ever mentioning any exhibit of record in the proceeding. We understand Patent Owner to refer to Petitioner’s Exhibit 1003, as this is the only occurrence of the ’627 application of record.

¹² The ’332 patent also describes “a movable retaining element,” which is a separate structure from the angled bristles that comprise the angled capsule retaining elements, that is described as some sort of openable access to the

that bristles are angled toward the center of a capsule receiving zone such that an oral care capsule can be loaded there-into by spreading apart the angled bristles, inserting the oral care capsule past the angled bristles, and depositing the oral care capsule in the capsule receiving zone; thereafter the angled bristles relax to their angled state and retain the oral care capsule. *Id.*; *see also id.* at 7:19–42, 9:54–10:11 (describing how a dispensing device can accomplish this loading).

Nowhere does the '332 patent use the term now agued by Patent Owner to be the correct understanding of angled bristles: *tufts*. The '332 patent describes two types of bristles—angled ones and vertical ones—and neither form is specifically described as or limited to a *tuft*. *See* Ex. 1001, 4:57–5:10. Patent Owner points to the figures of the '332 patent as support for its proposition that the angled bristles of the invention must be tufts, e.g., element 26A of Figure 1 is alleged to show that an angled bristle is an intentionally angled tuft of bristles as compared to element 26, which is alleged to show a purely vertical tuft. Sur-reply 1–3. And, Patent Owner argues that the claims separately recite vertical bristles and angled capsule retaining element (angled bristles) and, therefore, they must be different and separate features of the invention where one is a purely vertical tuft and one is an intentionally angled tuft, respectively. Sur-reply 2–5.

We agree with none of Patent Owner's positions and find that the '332 patent's figures cannot be understood to require that an angled bristle (as an angled capsule retaining element) *must* be an entire angled tuft of bristles, as it is not clear what exactly is depicted as the bristles 26 and 26A

capsule receiving zone from the backside of the toothbrush opposite the bristles. *See* Ex. 1001, 5:13–19, 6:8–25.

in the patent's figures. These elements are not drawn as conventional toothbrush bristles, but appear as solid tubes or cylinders, sometimes with textured ends and sometimes not, which are not elsewhere described in the '332 patent. *Id.* at Figs. 1, 4–6. Indeed, the '332 patent provides no description to sufficiently explain these drawing peculiarities.

Also, we find that the '332 patent's claims themselves support that angled bristles and vertical bristles need not be organized into wholly separate tufts of bristles. This is because, as the written description explains, to insert an oral care capsule into the toothbrush's receiving zone within the angled bristles, the capsule must be moved *past the angled bristles*. *Id.*, e.g., at 5:11–13. However, the claims expressly recite that, in such a method, the oral care capsule is (also) inserted “*past the vertical bristles into the recess*” where it is then retained “using the at least one pair of angled capsule retaining elements.” *Id.* at 11:19–24 (claim 9), 12:20–24 (claim 14). Thus, the claimed invention contemplates an embodiment with vertical and angled bristles configured such that an oral care capsule must be moved past both types of bristles to then be retained by the angled ones. This undercuts Patent Owner's argument that angled and vertical bristles must be somehow segregated into separate tufts, or otherwise.

For these reasons, we disagree with Patent Owner and decline to limit the scope of “angled capsule retaining element” beyond identifying that it includes *angled bristles*, even if it may not be limited to only such a structure (and its equivalents). *See Nidec*, 868 F.3d 1013, 1017 (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’”). As explained below, the prior art teaches (as conceded by Patent Owner and its expert witness) angled bristles to retain a

dentifrice capsule/pellet on a toothbrush, therefore, no further claim interpretation is necessary to resolve this matter.

D. PETITIONER’S ASSERTED PRIOR ART

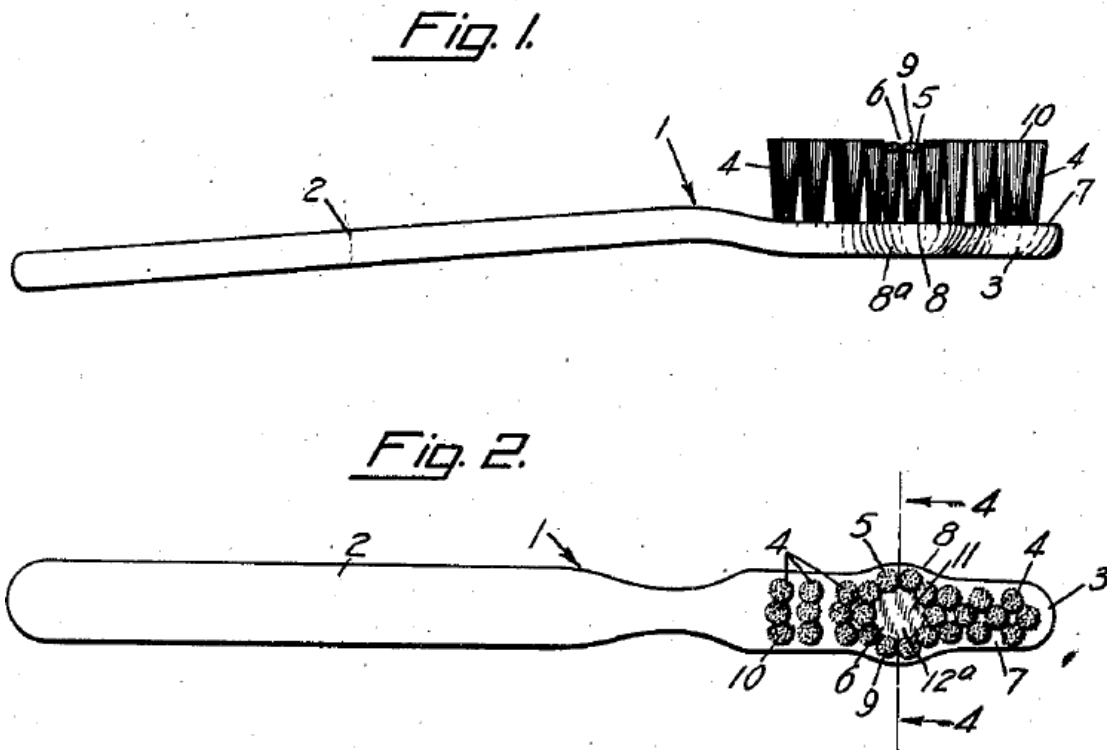
1. Wolcott (Ex. 1009)

Wolcott is a U.S. Patent that issued on November 18, 1941. Ex. 1009, cover page. There is no dispute that Wolcott is prior art. *See generally* Resp.

Wolcott discloses a “TOOTHBRUSH,” having bristles incorporated into the brush to “provide an improved pocket for receiving a dentifrice pellet” that can be used in the cleaning of the teeth and massaging of the gums. Ex. 1009, 1:19–26.¹³ Wolcott further states that its invention “provide[s] . . . [an] arrangement of bristles and pocket whereby the dentifrice pellet, while readily inserted, is effectively maintained against accidental separation from the brush,” accomplished via “improved supplementary bristle means disposed in the pellet aperture,” which “cooperat[e] in an improved manner.” *Id.* at 1:31–39.

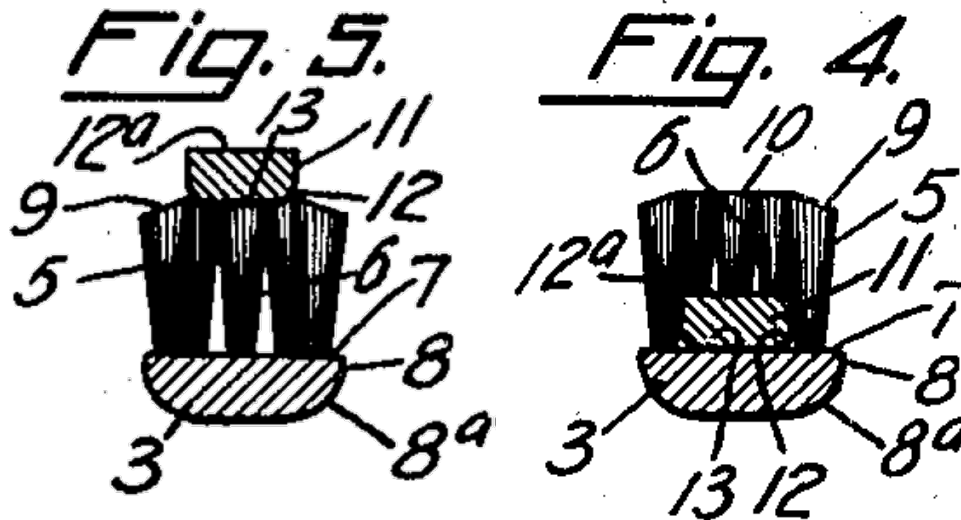
¹³ Wolcott does not include column numbering like contemporary U.S. patents. Therefore, we cite to Wolcott’s columns sequentially by counting. We do the same for the Davidson, Fitz-Gibbon, and Young references, which are older U.S. patents, similar to Wolcott in this regard.

Such a toothbrush and associated dentifrice pellet pocket are illustrated at Figures 1 and 2, which are reproduced below:



Id. at Figs. 1, 2. Figures 1 and 2, above, show toothbrush 1 from a side and top view, respectively. Toothbrush 1 has handle 2, bristle carrying portion 3 with bristles 4 “disposed in any usual manner,” but also bristles 5, which “are disposed in an improved manner . . . arranged around a central pellet recess 6 which is free from bristles and adapted to receive a dentifrice pellet.” *Id.* at 2:19–42. The pellet “may bottom on the usual flat surface 7 of the bristle carrying portion from which all bristles project.” *Id.* at 2:43–45. Bristles 5 are shown to “extend clear around the pellet recess 6” and “in such manner as thereby effectually to retain a pellet in said recess.” *Id.* at 2:49–3:1.

This is illustrated further by Figures 4 and 5, reproduced below:



Figures 4 and 5 are cross-section views of toothbrush 1 of Figure 2, above, through line 4-4. Figure 4 (above right) shows dentifrice pellet 11 held in recess 6 by the brush structure, and Figure 5 (above left) shows pellet 11 in the process of being inserted into recess 6 (just prior to). *Id.* at 3:18–20, 4:1–3. Wolcott explains that pellet 11 is positioned in this way by being inserted past bristles 5 (spreading them in process) into recess 6 so that bottom surface 13 of pellet 11 rests on flat surface 7 of bristle carrying portion 3 of toothbrush 1 forming the bottom of recess 6. *Id.* at 3:26–40. Further, in this position, top 12a of pellet 11 is disposed close to bristles 5 in their expanding tufts and, due to the resiliency of bristles 5, the opening of recess 6 is reduced and pellet 6 is retained therein, even if the toothbrush is inverted. *Id.* at 3:40–4:9.

Wolcott states that dentifrice pellet 11 is rounded so that, when inserted in recess 6, its rounded periphery 12 engages with the adjacent bristles in such a manner as to deflect their ends outward to facilitate

insertion and then, when moved to the bottom 13, pellet 11 rests on bottom of recess 6 and is disposed close to the bristles in the expanding tufts where the resiliency of the bristles causes them to swing back to reduce the size of the mouth of recess 6 after the insertion of pellet 11, which retains pellet 11. *Id.* at 3:26–67. Wolcott states, “[f]or example, should the brush be accidentally inverted befor[e] inserting in the mouth, the pellet will still remain in its recess, in its portion 12a then engaging the wider expanded tuft portions or moving into engagement therewith.” *Id.* at 4:4–9.

These features of the Wolcott toothbrush 1 are included as limitations in, for example, Wolcott’s claim 3, which reads:

3. A ***toothbrush*** having a bristle carrying closed back portion and an imperforate closed area, integral with said portion and on the bristle carrying face thereof providing a dentifrice pellet supporting surface on said face, and ***dentifrice disc receiving recess*** means having a closed bottom formed by said imperforate area, and said recess also having a normally open opposite end and ***walls formed by the bristles*** on said back and said bristles disposed to ***enable a dentifrice disc to be inserted freely through the open end of said recess and rest on said imperforate area***, adjacent the bottoms of said bristles, the ***bristle tufts forming the side walls of said recess*** projecting beyond the sides of the body of the brush and forming short narrow laterally projecting gum massaging extensions intermediate the ends of the body of the brush.

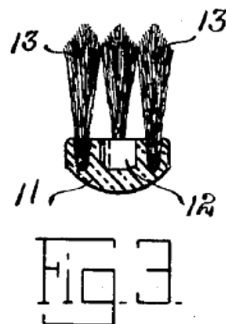
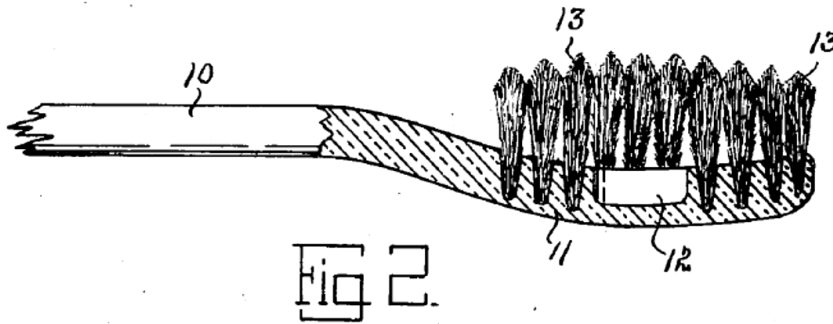
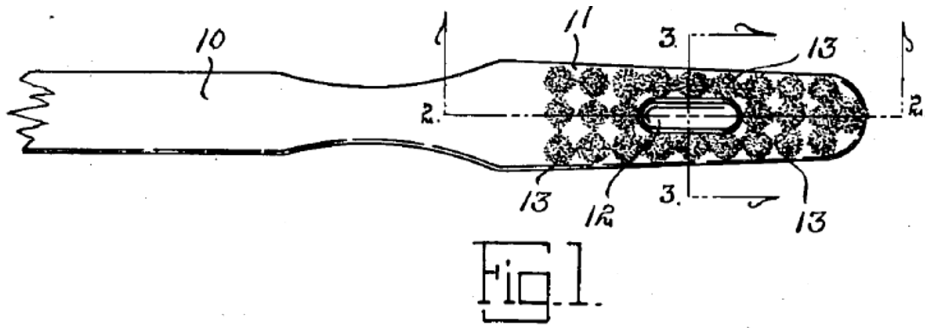
Id. at 6:37–54 (emphasis added).

2. Davidson (Ex. 1010)

Davidson is a U.S. Patent that issued on January 5, 1943. Ex. 1010, cover page. There is no dispute that Davidson is prior art. *See generally* Resp.

Similar to Wolcott, discussed above, Davidson discloses a toothbrush that receives and holds dentifrice (e.g., powder, liquid, paste, or other)

within a centrally located receiving area within the bristles. Ex. 1010, 1:1–10. Such a toothbrush is illustrated by Davidson's Figures 1–3, which we reproduce below:



Id. at Figs. 1–3. The figures above show a toothbrush (not labeled) having handle 10, head 11, well 12 (a recess) within head 11, and bristles 13 surrounding well 12, where Figure 1 (top) shows the toothbrush from above,

Figure 2 (middle) shows the toothbrush from a cross-sectional side view, and Figure 3 (bottom) shows the toothbrush from a cross-sectional end view. *Id.* at 1:23–2:1. Bristles 13 are described as completely surrounding well 12 and extending at right angles from head 11 so as to provide “an enlarged opening with the mass of bristles and above the well 12.” *Id.* at 2:1–7.

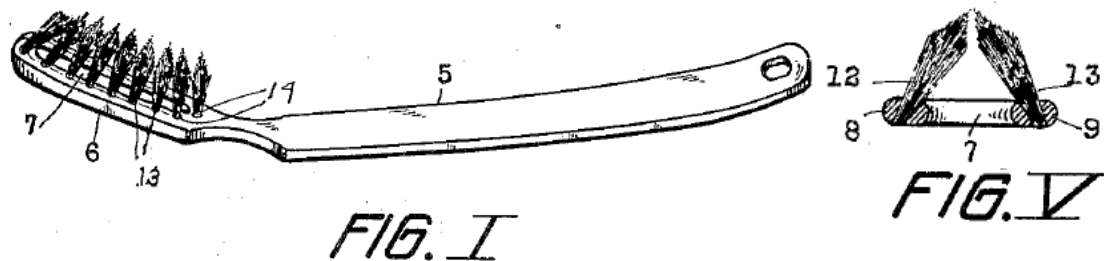
A “dentifrice may be poured into this central opening created by the bristles 12 extending around the well 12” and “the bristles provide sides and ends to this receiving area in the bristles” such that supplied “dentifrices may fall downwardly and be received and held by the well 12.” *Id.* at 2:8–14. “The surrounding bristles as well as the well 12 will successfully hold this ample amount of powder dentifrice until the brush is within the mouth of the user.” *Id.* at 2:24–28. Davidson states that “[b]y the well 12 being closed at all points except its top, it will have a tendency to hold the dentifrice, *regardless of the type of the dentifrice*, by suction.” *Id.* at 3:20–24 (emphasis added).

3. Fitz-Gibbon (Ex. 1011)

Fitz-Gibbon is a U.S. Patent that issued on July 13, 1920. Ex. 1011, cover page. There is no dispute that Fitz-Gibbon is prior art. *See generally* Resp.

Similar to Wolcott and Davidson, Fitz-Gibbon discloses a toothbrush having bristles on the face, but also an opening in the toothbrush’s head, that define a “pocket for holding the dentifrice.” Ex. 1011, 1:18–23.

Such a toothbrush is illustrated at Figures 1 and 5, which we reproduce side-by-side below:



Id. at Figs. 1, 5. Figure 1 is a side perspective view, and Figure 5 is a cross-sectional end view, of a toothbrush having handle 5, head 6, opening 7 in head 6, sides 8, 9, and tufts/clusters of bristles 12, 13, 14. *Id.* at 1:38–2:65.

Fitz-Gibbons states:

The series 12 and the series 13 [bristles] converge inwardly so that their tips are but slightly spaced from each other. On the portion 10 a brush tuft 14 is embedded at its inner end and extends inwardly toward the tips of the series 12 and 13 [bristles] and are sharply inclined relative thereto so that the tips of said tufts 14 will engage the lingual surfaces of the teeth.

Id. at 2:64–73. And, further: “The bristles are so disposed on the brush head as to provide a dentifrice holding chamber or pocket and the opening 7 permits of the deposition of the dentifrice in said chamber or pocket through the back of the brush head.” *Id.* at 2:79–84.

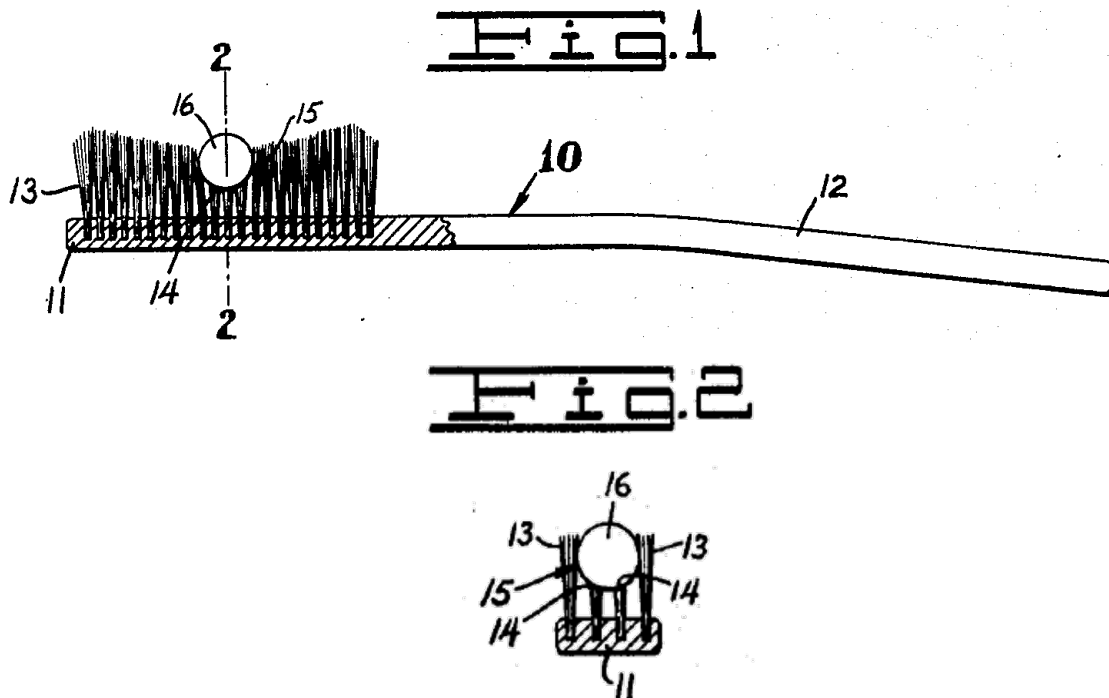
4. Young (Ex. 1012)

Young is a U.S. Patent that issued on March 26, 1935. Ex. 1012, cover page. There is no dispute that Young is prior art. *See generally* Resp.

Like Wolcott, Davidson, and Fitz-Gibbon, Young discloses a dentifrice holding toothbrush having “bristles wherein a portion of the bristles are arranged to form a pocket for the reception of a pellet of

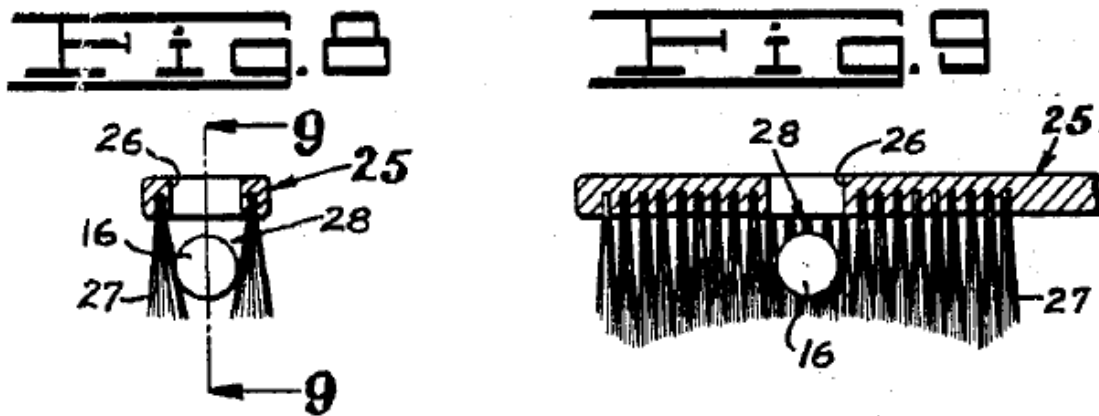
dentifrice.” Ex. 1012, 1:1–9. Several embodiments of such a toothbrush are disclosed in Young, which position the pocket and inserted dentifrice in a variety of locations on the toothbrush head, e.g., resting above bristles’ tips, held within bristles and below their tips, and at a distal tip of the toothbrush.

Figures 1 and 2 are reproduced below:



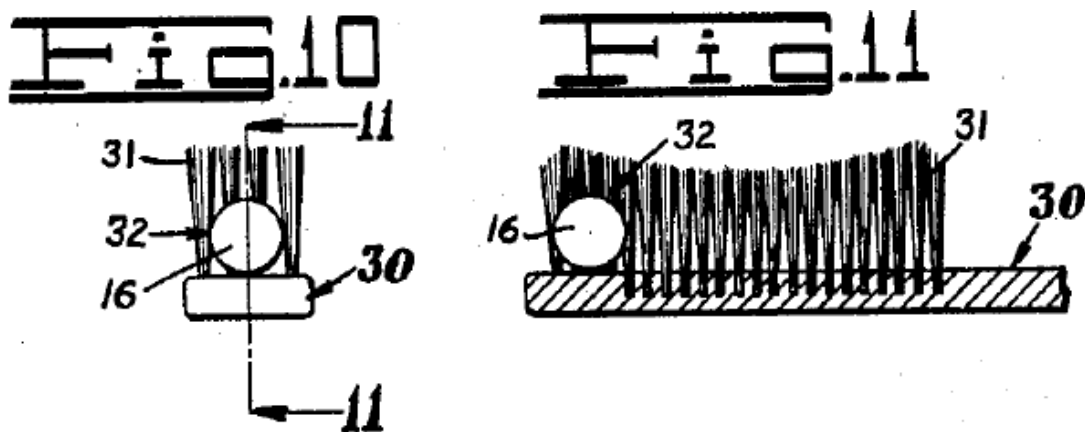
Id. at Figs. 1, 2. Figure 1 (top) shows a side view, partly cross-sectioned, and Figure 2 (bottom) shows an end cross-sectional view through line 2-2 of Figure 1, of toothbrush 10, which has head 11, handle 12, bristle tufts 13, shorter tufts 14 providing a pocket 15, for dentifrice pellet 16. *Id.* at 1:16–50.

We also reproduce Figures 8 and 9, below:



Id. at Figs. 8, 9. Figure 8 (left) shows an end cross-sectional view, and Figure 9 (right) shows a side cross-sectional view through line 9-9 of Figure 8, of toothbrush 25 having a head with a hole 26 therethrough, and bristles 27, forming a pocket 28 for dentifrice 16. *Id.* at 1:28–29, 2:21–26. Young states, “[t]he bristles are resilient and thus when a pellet is passed through the hole 26 it is engaged and retained by the bristles as shown in Figs. 8 and 9.” *Id.* at 2:26–29.

Figures 10 and 11 are reproduced below:



Id. at Figs. 10, 11. Figure 10 (left) shows an end cross-sectional view, and Figure 11 (right) shows a side cross-sectional view through line 11-11 of Figure 10, of toothbrush 30 having bristles 31 forming pocket 32 for dentifrice pellet 16. *Id.* at 2:30–34. Young states, “[t]hese bristles in the center of the brush at one end are omitted thus forming a pocket 32 in which the pellet 16 will be retained in place by the resiliency of the bristles.” *Id.*

5. Sorrentino (Ex. 1013)

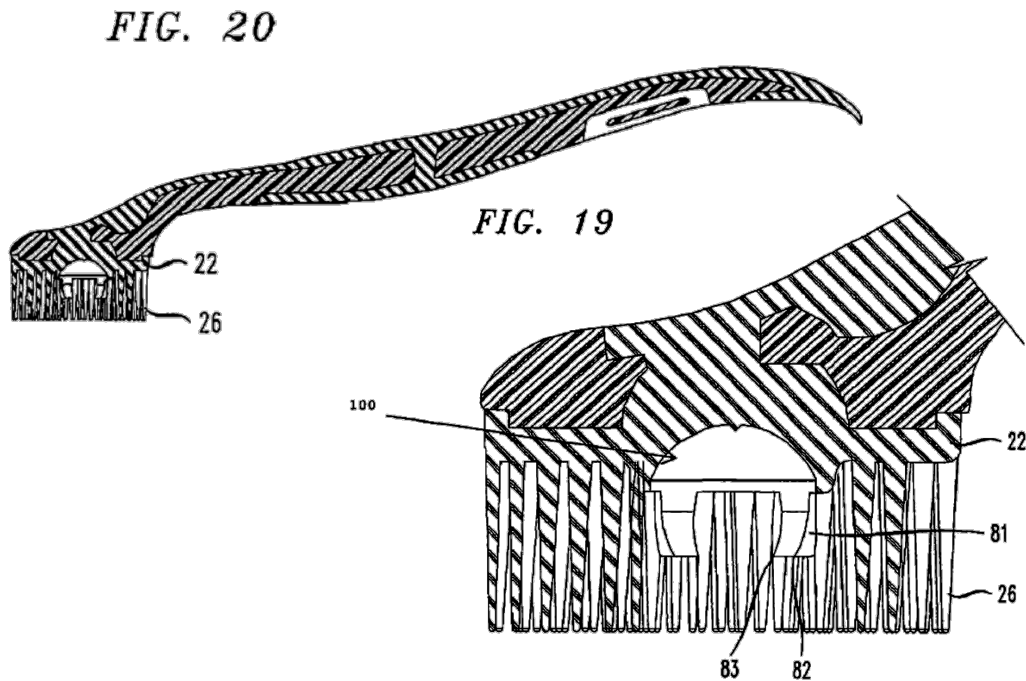
Sorrentino is a U.S. Patent that issued on August 14, 2012, from U.S. Application 12/018,817, which was filed on January 24, 2008. Ex. 1013, codes (45), (21), (22). Sorrentino indicates priority to a series of U.S. and international applications spanning a range of filing dates from September 5, 2002, to December 21, 2005. *Id.* at code (63). The parties dispute whether Sorrentino is prior art. *See* Pet. 11–18, 92; Resp. 3–8; *see infra* Section II.E.

Sorrentino states it is directed to the following:

An oral care toothbrush includes a head mounted to one end of the handle containing a plurality of oral care elements. An oral care accessory is mounted to the opposite end of the handle. An oral care dispenser is mounted in the head within the cleaning field defined by the oral care elements. The oral care dispenser may be held in place by a plurality of prongs located in the field defined by the oral care elements. The toothbrush may be made of small size and of lightweight so as to be readily portable for use away from the home.

Ex. 1013, Abstract.

A toothbrush, as noted in the Abstract, is illustrated at Figures 19 and 20, which are reproduced, side-by-side, below:



Id. at Figs. 19, 20. Figure 20 (above-left) shows a cross-sectional view of a toothbrush and Figure (above-right) shows an enlarged cross-sectional view of the head of the toothbrush. *Id.* at 3:58–61. Toothbrush 10 (not labeled) has head 12/80 (not labeled) and handle 14 (not labeled). *See id.* at 4:1–4 (describing Figs. 1–4), 11:35–13:32. Head 12 includes bristle or cleaning element block 22 having bristles or fingers 26, and cavity 100 with a series of retaining members 81 for holding an oral care dispenser, such as a bead of dentifrice. *Id.* at 4:49–61, 11:35–13:32. Some or all of the cleaning elements 26 may be angled at various angles with respect to the outer surface of head 12, and retaining members 81 may be curved inwardly to hold the dentifrice in place. *Id.* at 5:17–21, 12:51–54. Cavity 100 may have

retaining members 81 laid out in a variety of shapes, e.g., a triangle, a square, or a rectangle. *Id.* at 12:38–45.

E. PRIORITY

As an initial matter, we note that the parties’ priority arguments affect only the Sorrentino-based grounds (5 and 6) because the prior art status of the other relied-upon patent references is not disputed.

Petitioner argues that the ’332 patent’s claims are not entitled to a priority date any earlier than their actual filing date of April 11, 2008. Pet. 11–18. Petitioner asserts that “[n]umerous claim elements lack support in the parent application ([the] ’627 Application’ (Ex. 1003)),” and further argues that, if the “angled capsule retaining elements” claim language is not a means-plus-function limitation, meaning the claims are not limited to only angled bristles (and equivalents) as such retaining elements, then the claims are further not entitled to priority to the parent application because it fails to provide support for any such structure broader than angled bristles. *Id.* at 11–18 (citing, *inter alia*, Ex. 1008 ¶¶ 102–108).

Patent Owner argues that the ’332 patent’s claims are entitled to priority to the August 17, 2007, filing date of the ’627 application. Resp. 3–8. Patent Owner argues that, other than the subject matter directed to a dentifrice dispensing device, the disclosures of the ’332 patent and the ’627 application are the same and, further, that the claim elements are supported by those disclosures. *Id.*¹⁴

¹⁴ We note that Patent Owner continues to fail to expressly cite to exhibits of record, but merely identifies the ’332 patent and the ’627 application. In our Institution Decision (DI 23 n.13) we requested that, in future briefing such as Patent Owner’s Response and Sur-reply, the parties expressly identify exhibits of record when citing to evidence.

As in our Institution Decision, here we need not decide whether the '332 patent's claims are entitled to priority to the '627 application's filing date because such a determination would serve only to confirm whether the Sorrentino reference is prior art.¹⁵ Because we find, as discussed below, that Petitioner has met its burden to show the challenged claims would have been obvious and are unpatentable over prior art combinations not including Sorrentino, we need not further address this issue or any ground requiring Sorrentino. *See* Hr'g Tr. 5:14–17 (Petitioner agreeing); *see also generally* Reply (Petitioner does not address Grounds 5 and 6 requiring Sorrentino); *see infra* Section II.H (not reaching the merits of Grounds 5 and 6).

F. GROUND 1 AND 2—OBVIOUSNESS OVER WOLCOTT, DAVIDSON, AND FITZ-GIBBON

As we noted in our Institution Decision, the facts and allegations under Petitioner's Ground 2 subsume those of Ground 1. *See* DI 24; Pet. 26–58. And, again, Patent Owner's positions opposing Grounds 1 and 2 substantially overlap. *See* DI 24; Resp. 8–17, 18–20. Accordingly, we discuss the two grounds together. For the reasons discussed below, we find Petitioner has shown by a preponderance of the evidence that challenged claims 1, 2, and 5–18 are unpatentable as obvious over the combination of Wolcott and Davidson, and over Wolcott and Davidson also including

¹⁵ As discussed below, we do not reach the merits of the grounds based on Sorrentino and do not rely on Sorrentino's teachings as part of our analysis. Aside from the question of whether Sorrentino qualifies as prior art, neither party identifies any material distinction in the person of ordinary skill in the art's background knowledge that would change our decision regardless of whether the priority date of the claims is August 2007 versus April 2008.

Fitz-Gibbon. No argument presented by Patent Owner is persuasive to change our conclusion. Our analysis follows.

1. Parties' Positions

Under Grounds 1 and 2, Petitioner challenges independent claims 1 and 10, and their dependent claims 2, 5–9, and 11–18, as obvious over Wolcott and Davidson, and also over these two prior art references combined with Fitz-Gibbon. Pet. 26–58 (citing, *inter alia*, Ex. 1008 ¶¶ 26, 116–122, 124–125, 128, 130–140, 142–157, 160–164, 166–167, 170–171, 175–176, 179–180, 183–186, 190–192, 194–224, 226–228, 231–235; Ex. 1009, 1:26–35, 1:53–2:3, 2:19–24, 2:33–45, 2:49–3:1, 3:18–27, 3:44–54, 3:61–67, 4:4–9, Figs. 1, 2, 4, 5, 9; Ex. 1010, 1:1–10, 1:51–55, 2:11–27, 3:20–24, Figs. 1–3; Ex. 1011, 1:58–67, Figs. 3, 5).

To summarize Petitioner's positions, Petitioner asserts that each of Wolcott, Davidson, and Fitz-Gibbon is directed to a toothbrush having a zone within its bristles for receiving and holding dentifrice, making each reference analogous art, and obviously and predictably combinable to provide the advantages of being able to better receive, hold, and deliver such dentifrice. *Id.* at 26–28, 49–51 (citing Ex. 1008 ¶¶ 116–122, 199–207; Ex. 1009, 1:26–35, 2:38–54, 3:61–67, 4:4–9, Figs. 2, 4; Ex. 1010, 1:1–10, 1:51–55, 3:20–24, Figs. 1–2; Ex. 1011, 1:58–67, 1:79–87, Figs. 3, 5).

Petitioner asserts that the teachings of Wolcott and Davidson would have been combined by the ordinarily skilled artisan (with a likelihood of success) because each is primarily concerned with retaining dentifrice, e.g., as a pellet or other form, on a toothbrush, within a pocket or recess in an arrangement of bristles, and the teachings of one reference (e.g., adding a recessed, dentifrice-holding well as in Davidson to Wolcott's toothbrush)

would inform and enhance the teachings of the other as to this common objective. *Id.* at 26–28, 34–35. As for also adding the teachings of Fitz-Gibbon to the Wolcott-Davidson combination, Petitioner asserts that this third reference, too, is concerned with retaining dentifrice in an area within bristles on a toothbrush and that, again, the advantages offered by Fitz-Gibbon’s teachings, e.g., of angling entire tufts of bristles to better retain dentifrice, would also similarly (predictably, with expected success) advantage a toothbrush achieved by the Wolcott-Davidson combination. *Id.* at 49–51.

Petitioner maps the teachings of the prior art to the elements of independent claims 1 and 10, and dependent claims 2, 5–9, and 11–18, and asserts that the disclosed features of the combined prior art toothbrushes meet all elements of the claims, making the claims obvious. Pet. 28–49, 51–58 (citing Ex. 1008 ¶¶ 26, 124–126, 128, 130–140, 142–157, 160–164, 166–167, 170–171, 175–176, 179–180, 183–186, 190–192, 194–198, 209–224, 226–228, 231–235, 238–240; Ex. 1009, 1:26–35, 1:53–2:3, 2:19–24, 2:33–45, 2:49–3:1, 3:18–27, 3:44–54, 3:61–67, Figs. 1, 2, 4, 5, 9; Ex. 1010, 1:1–27, 1:51–55, 2:11–27, 3:20–24, Figs. 1–3; Ex. 1011, 1:58–67, Figs. 3, 5).

Regarding independent claims 1 and 10, Petitioner asserts that every element is taught or suggested by Wolcott. *Id.* Pointing to the reference’s Figures 1, 2, 4, and 5, and related description, Petitioner asserts that Wolcott discloses the challenged independent claims’ elements as toothbrush 1 having a front and back surface, with both vertical and angled bristles arranged across the toothbrush’s head portion 3, where angled bristles 4 circularly surround a dentifrice receiving recess 6 for receiving and holding

an oral care pellet 11 (or capsule).¹⁶ *Id.* (citing, *inter alia*, Ex. 1008 ¶¶ 26, 124–125, 128, 130–140, 142–145, 148–149, 151–152, 155–157). Petitioner asserts that the claim limitations to the arrangement of angled bristles (the claimed “angled capsule retaining elements”) requiring that they be (2 angled bristles) positioned in diametric opposition to one another or (3 angled bristles) at least 108° apart, respective of claims 1 and 10, are taught by Wolcott’s circular arrangement of several (shown as at least 10 in Wolcott’s Fig. 2) tufts with angled bristles around the pellet-receiving recess. *Id.* at 38–40.

As reinforcement for the obviousness of the claimed toothbrush, Petitioner, pointing to Davidson’s Figures 1–3 and related description, asserts that Davidson also teaches essentially all the same features, including the similarly structured and arranged bristles on a toothbrush, and that Davidson teaches a fully-recessed well 12 (within the toothbrush head) for its dentifrice zone, surrounded by angled bristles that, in Davidson, retain dentifrice (“regardless of the type”). *Id.* at 33–41 (citing, *inter alia*, Ex. 1008 ¶¶ 137–140, 146–147, 150–154; Ex. 1010, 3:20–24). Petitioner asserts that the ordinarily skilled artisan would have understood that such a well recess would have increased the ability of Wolcott’s toothbrush to retain a dentifrice pellet. *Id.* at 34–35.

¹⁶ As noted above, the ’332 patent states that oral care capsules, such as described as used with its toothbrush 10, “[we]re known,” and took a variety of forms (e.g., beads and capsules) and shapes, and were used with conventional toothbrushes “in the normal manner.” Ex. 1001, 2:51–2:23; *see supra* Section I.C. (reviewing the ’332 patent). Hence, we make no distinction between the prior art’s pellets and capsules of dentifrice.

Under Ground 2, Petitioner adds to the aforementioned combination of Wolcott and Davidson, Fitz-Gibbon's teaching of bristles, which are even more clearly angled, as a series of tufts of bristles provided around and angled towards the center of a dentifrice-holding zone to retain dentifrice inserted therein, as shown in Figures 3 and 5 of the reference. *Id.* at 28–49, 51–58 (citing, *inter alia*, Ex. 1008 ¶¶ 26, 212–222). Petitioner's position is that the bristles of Wolcott would be modified or replaced to be oriented around its pellet recess to be similar to those of Fitz-Gibbon, so as to even better hold the dentifrice pellet, but “still allow for front-loading the pellet,” by “spreading the bristles . . . to load a capsule,” as taught by Wolcott. *Id.*

As noted above at Section I.C, the dependent claims more narrowly define aspects of the '332 patent's claimed toothbrush; Petitioner accounts for each added element (or step) of each of challenged dependent claims 2, 5–9, and 11–18 as taught in or suggested by the asserted prior art. *See* Pet. 41–49, 56–58 (citing Ex. 1008 ¶¶ 26, 160–164, 166–167, 170–171, 175–176, 179–180, 183–186, 190–192, 194–198, 223, 224, 226–228, 231–235, 238–240; Ex. 1009, 1:26–31, 2:23–24, 2:33–39, 3:18–27, 3:44–54, 3:61–67, Figs. 2, 4, 9; Ex. 1010, 2:11–27, Figs. 1–3; Ex. 1011, Figs. 3, 5). To summarize, covering each challenged dependent claim's limitation(s), Petitioner asserts: Wolcott teaches (and largely Davidson, too) angling bristles toward the center of a capsule receiving zone; a flexural portion permits the insertion of a dentifrice capsule/pellet into a receiving zone; dentifrice pellets/capsules are inserted downwardly past angled and vertical bristles, spreading them apart, and that the bristles then spring back to hold the pellet/capsule; several angled bristles (at least three) are provided; angled bristles are between vertical ones and a center of a capsule receiving zone;

angled bristles overlap part of a capsule receiving zone; and angled bristles are provided at least 144° apart from one another around a capsule receiving zone. *Id.* at 41–49. Moreover, Petitioner also asserts Fitz-Gibbon teaches all the dependent claim elements directed to “angled capsule retaining elements” (i.e., angled bristles). *Id.* at 56–58.

Much of Petitioner’s assertions and mapping of claim elements to the prior art is uncontested by Patent Owner. *See generally* Resp; *see also* Hr’g Tr. 8:8–13, 13:19–23, 14:7–10, 27:25–28:17 (parties confirming disputed issues focus primarily upon whether the prior art teaches “angled capsule retaining elements,” as claimed). For example, Patent Owner does not dispute that Wolcott, Davidson, and Fitz-Gibbon are prior art, or that this prior art teaches and suggests, as claimed, a toothbrush having a front and back surface, vertical bristles, a capsule receiving zone (generally, other than its relation to the surrounding “angled capsule retaining elements”), a recess, or a dentifrice capsule. *See generally* Resp; *see also* Hr’g Tr. 8:8–13, 13:19–23, 14:7–10, 27:25–28:17. Furthermore, other than conclusory statements asserting without explanation that claim language is not met, Patent Owner does not separately argue for the patentability of any dependent claim. *See* Resp. 29–36.

In most substantial part, Patent Owner’s arguments in opposition to Petitioner’s challenges foundationally rely on its position that the recited “angled capsule retaining elements” cannot be just angled bristles, but must be angled *tufts* of bristles, which we addressed above as an incorrect claim interpretation, unsupported by the intrinsic record. *See* Resp. 8–12 (relating to Wolcott), 14 (relating to Davidson), 18–19 (relating to Ground 1), 27; *see* Sur-reply 1–12, 16–17; *see supra* Section II.C (claim construction). Patent

Owner's argument is that even if Wolcott (and Davidson) teach that certain bristles of their toothbrushes are angled bristles, and that they border the perimeter of a recess for holding a dentifrice pellet in place, these angled bristles cannot be the claimed "angled capsule retaining elements" because the greater *tufts* of bristles were not *intentionally* angled for this purpose. Resp. 8–12, 18–19; Sur-reply 1–16. Thus, because the angled bristles (according to Patent Owner's apparent interpretation of the claims) are not present in the prior art, neither is any other claim element requiring some relationship to angled bristles, e.g., "angled capsule retaining elements that are elevated above the recess and configured to retain an oral care capsule in the capsule receiving zone." Resp. 18–19; Sur-reply 16–17.

Patent Owner also attacks Petitioner's reliance on Davidson, arguing its toothbrush is not designed to hold an oral care capsule, but only powder. Resp. 12–14. Patent Owner argues, for this reason, an ordinarily skilled artisan would not have combined Davidson's dentifrice well 12 with Wolcott's toothbrush's pellet recess. *Id.* at 18–19.

Patent Owner follows with an argument that Fitz-Gibbon's toothbrush is not designed to allow a dentifrice pellet to be inserted from its front-side, through its bristles, but only into an orifice in the rear, and because of this teaches away from the claimed invention, and that using Fitz-Gibbon's angled bristles in a toothbrush as taught by Wolcott and Davidson would render the combination unsatisfactory for the intended purpose (of having a toothbrush with angled bristles to hold a dentifrice pellet inserted past those bristles into a recess). Resp. 15–17, 19–20; Sur-reply 17–19.

Finally, Patent Owner asserts that objective indicia of non-obviousness, in the form of a long-felt and unsatisfied need, evidence the

patentability of the challenged claims. Resp. 36–39; *see also* Hr’g Tr. 39:13–42:17 (Patent Owner confirming this is its only briefed objective indication argument). Patent Owner’s argument is vague and ambiguous, but is understood as premised on a contention that Petitioner Colgate spent about six years developing toothbrushes with similarities to that disclosed by Sorrentino (Ex. 1013), which Patent Owner refers to in its briefing as “Sorento,” which itself has similarities to the claimed invention (allegedly, according to Petitioner). Resp. 36–39. Patent Owner reviews several such toothbrush designs that were “never commercialized by Colgate.” *Id.* Patent Owner suggests that this lack of commercialization was somehow a failure to achieve some long-felt need, which is never expressly identified in Patent Owner’s briefing. *Id.*; *see also* Hr’g Tr. 42:18–43:3 (Patent Owner identifying, *for the first time*, that the long-felt need it intended to argue “was for something that would make it [the pellet/capsule on the toothbrush] portable, that you could preload the dentifrice and take it with you, carry it upside down, sideways, bounce it around, and the dentifrice would still be there, that’s the need”).

2. Analysis

We agree with Petitioner’s positions and are not persuaded by any of Patent Owner’s arguments. Petitioner has sufficiently, and we find accurately, mapped the limitations of the challenged claims to the disclosures of Wolcott, Davidson, and Fitz-Gibbon, identified reasons with rational underpinnings why the ordinarily skilled artisan would have combined the teachings of the references, and shown that there would have been a reasonable expectation of success in such a predictable endeavor.

Regarding the reasons to combine Wolcott, Davidson, and Fitz-Gibbon, they are each analogous art as each is directed to solving the problem of retaining dentifrice, a pellet or *any* dentifrice, on a toothbrush, within a dedicated space between its bristles. *Donner Technology, LLC v. Pro Stage Gear LLC*, 979 F.3d 1353, 1359 (Fed. Cir. 2020) (the prior art is from the same field of endeavor as the invention and also addresses the particular problem with which the invention/inventor is involved); *see generally* Ex. 1009; 1010; 1011; *see also* Ex. 1008 ¶¶ 115–122, 199–207 (Mr. Fletcher testifying to the same). We agree that the prior art combination and asserted modifications would be predictable and well within the level of ordinary skill to accomplish, making success entirely expected. Ex. 1008 ¶¶ 115–122, 199–207; Ex. 1009; 1010; 1011. Furthermore, we agree with Petitioner that the advantages disclosed by Davidson regarding its bristles 13 and well 12 retaining any type of dentifrice would similarly advantage Wolcott’s toothbrush, which is designed to similarly retain a dentifrice pellet in a recess using bristles. *See* Ex. 1009, 1:1–41, 2:39–3:1, 3:55–4:9, Figs. 4, 5; Ex. 1010, 2:11–14, 2:24–27, 3:20–24, Figs. 1–3; *see also* Ex. 1008 ¶¶ 121–122. Similarly, Fitz-Gibbon discloses its toothbrush’s bristles or, more accurately, tufts of bristles 13, are disposed at an angle toward, and to hold, dentifrice in a chamber/pocket; we find this feature, which Fitz-Gibbon describes as “exceedingly valuable,” would also have been reasonably incorporated into the toothbrush achieved by the combination of Wolcott and Davidson, with an expectation of success. Ex. 1008 ¶¶ 204–207; Ex. 1011, 2:58–87. Thus, we agree with Petitioner that a skilled artisan would have had ample reason

to combine Wolcott and Davidson, or Wolcott, Davidson, and Fitz-Gibbon, and the result of doing so would have been obvious.

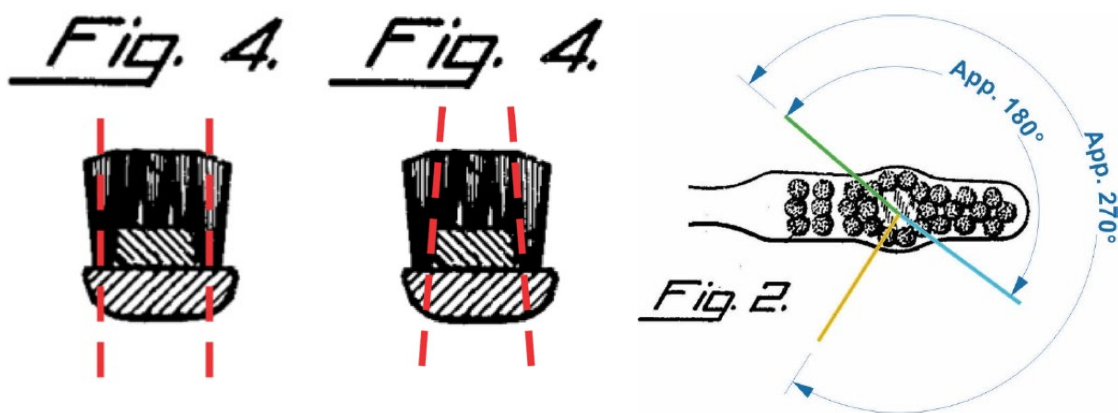
We are not persuaded by Patent Owner’s argument that Fitz-Gibbon teaches away, either from the invention or a combination with the other prior art, or that combining Fitz-Gibbon with Wolcott would render a toothbrush inoperable. A reference teaches away from a claimed invention if it “criticizes, discredits, or otherwise discourages” modifying a reference to arrive at the claimed invention. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). We find nothing in Fitz-Gibbon that *discourages* modifying Wolcott’s toothbrush to further angle (tufts of) bristles in Fitz-Gibbon’s fashion. Patent Owner identifies no such discouragement, but only points to Fitz-Gibbon’s lack of vertical bristles such that, allegedly, an oral capsule could not be inserted past vertical bristles, but only through the back of Fitz-Gibbon’s toothbrush. *See* Resp. 19–20. However, the proposed combination of Wolcott, Davidson, and Fitz-Gibbon would not require back-loading of the dentifrice. And, even if the so-modified angled tufts needed to be tilted or disposed at slightly greater distances from adjacent tufts to better facilitate front-loading of the dentifrice (as taught by Wolcott and Davidson), no more than ordinary skill and creativity would be required. *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985) (rejecting an argument that “presumes stupidity rather than [ordinary] skill”); Ex. 1008 ¶¶ 204–207.

We are also not persuaded by Patent Owner’s argument that bristles as in Fitz-Gibbon are too close together to allow a dentifrice capsule to pass, which would make such a modification to Wolcott’s toothbrush inoperable. *Sovish*, 769 F.2d at 743. As explained by Mr. Fletcher, modifying Wolcott’s toothbrush in view of Fitz-Gibbon “would require simply tilting the tufts of

bristles . . . toward the center dentifrice receiving area,” in a predictable fashion so that “tilting the bristles 5 as taught by Fitz-Gibbon would still allow for front-loading of the pellet.” Ex. 1008 ¶¶ 204–207; *see also* Ex. 1019, 53:1–16 (Mr. Kodama conceding that modifying Wolcott so its bristles were angled as in Fitz-Gibbon would help retain a dentifrice pellet and would have required “no great engineering”).

Turning to the disclosure of the prior art combinations, once the references’ teachings are combined (as we just concluded is proper and obvious), and considering our determination that the meaning of “angled capsule retaining elements” includes within its scope *angled bristles*, there remains no reasonable dispute that every challenged claim is entirely taught by and obvious over the cited prior art.

Petitioner argues, and effectively illustrates using annotated versions of Wolcott’s Figures 2 and 4, that Wolcott discloses all the elements of the independent claims. *See* Pet. 26–49; *see also* Ex. 1008 ¶¶ 26, 123–157. We reproduce and discuss those annotated figures below:



The annotated versions of Wolcott Figure 4 (above left and center) show an end-cross-sectional view of the toothbrush (with a front and a back surface)

where bristles (highlighted by red dashed lines) extend from the front surface both vertically (left figure) and also angled inwardly (center figure) toward a dentifrice pellet (i.e., an oral care capsule) within a pellet receiving pocket recess, i.e., an oral care capsule receiving zone, below the vertical and angled bristles. Ex. 1008 ¶¶ 26, 115–157. As shown in Figure 4 (highlighted at middle), the angled bristles contact the dentifrice pellet once inserted, and Wolcott explains that when the pellet is inserted into the recess past the vertical and angled bristles, they spread apart and then snap back to retain it. *Id.* ¶ 156; Ex. 1009, 3:17–4:9. The angled bristles are between the vertical ones and the recess. Annotated Figure 2 shows a front surface view of the head of the toothbrush and illustrates that multiple such bristles are arranged all over the front surface of the toothbrush, other than in the pellet recess, which they encircle and define, and also shows that those bristles around the pellet recess are arranged so that they (at least 2) diametrically oppose one another and (at least 3) are spaced at least 108° (or more, up to just short of 360°) apart. Ex. 1008 ¶¶ 148–149, 153.

Wolcott’s disclosure makes apparent that its toothbrush is designed for the same purpose as that of the challenged claims and achieves this purpose in the same way, or at least a way that makes the claimed toothbrush obvious. Wolcott states that its “invention relates to toothbrushes” and that this toothbrush “dispose[s] the supplementary bristles and the other bristles of the brush in an improved manner to provide an improved pocket for receiving a dentifrice pellet whereby the process of applying the dentifrice to the brush is materially facilitated.” Ex. 1009, 1:1, 1:17–22. Wolcott’s toothbrush’s bristles, angled and vertical, and the dentifrice pellet pocket are illustrated in the figures above and show the pellet being held in a recess by

angled bristles. *Id.* at 2:26–3:1. We know this is how the toothbrush functions because Wolcott, in describing how a dentifrice pellet is inserted in the toothbrush’s recess and then held, states:

As the pellet moves downward into the recess [(past vertical and angled bristles as shown in Figs. 5 and 4)], the surfaces 12 on the pellet spring apart the bristles surrounding the recess, and these bristles then spring back in such a manner as to securely position the pellet at the bottom of the recess, as shown in in Figure 4. . . . Herein, these bristles 5 [(those immediately surrounding the recess 6)] also act to cooperate with the other adjacent bristles 4 [(those spaced further away from the recess 6)] in preventing loss of the pellet. For example, should the brush be accidentally inverted befor[e] inserting in the mouth, the pellet will remain in its recess, its portion 12a [(the top surface of the pellet)] then engaging the wider expanded tuft portions [(the angled bristles as shown above in Fig. 4)] or moving into engagement therewith.

Id. at 3:60–4:9. This well explains that Wolcott’s toothbrush incorporates all the elements required by challenged independent claims 1 and 10, i.e., a toothbrush with a front and back, vertical bristles, a capsule receiving zone recess for an oral care capsule in the front surface where the capsule is inserted past the vertical bristles, several angled capsule retaining elements above the recess (spaced in diametric opposition or at least 108° apart), where the angled capsule retaining elements (angled bristles) contact the oral care capsule to hold it. *See* Ex. 1001, 10:30–50, 11:25–12:5.

As noted above, most of Wolcott’s teachings of the claim elements are undisputed. *See generally* Resp. Moreover, as to the primarily disputed claim element, the “angled capsule retaining elements” (angled bristles), Patent Owner’s expert, Mr. Kodama, concedes that Wolcott teaches (at Figure 4) angled bristles, surrounding the dentifrice pellet (when inserted) and the pellet receiving pocket, and that the pellet is inserted via the front,

into the recess, past and spreading apart the bristles, which then spring back to retain the pellet. Ex. 1019, 24:14–25:3 (Q. “When you say ‘they’re splayed out,’ as they’re installed in the face of the brush, those perimeter bristles end up splaying out and therefore as positioned, they’re at an angle, Agreed?” A. “Yes, they’re curved or [at] an angle.”), 25:18–26:1 (A. “I believe Figure 4 [of Wolcott] shows bristles that are at an angle, yes.”), 28:14–29:12, 31:10–20, 32:19–36:7 (Q. “Okay. And so in this [Wolcott] disclosure in Column 4, would you agree that Wolcott discloses that the angled bristles help retain the pellet when the brush is inverted?” A. “Yes.”); *see also* Hr’g Tr. 30:25–31:10 (Patent Owner, at final hearing, acknowledging these concessions by Mr. Kodama).

If more were needed, Petitioner also establishes that Davidson teaches essentially all the same structural elements, but additionally teaches that a dentifrice receiving zone of a toothbrush was known to be a recessed well in the front surface, below the bristles, as shown by Davidson’s Figures 2 and 3, reproduced below:

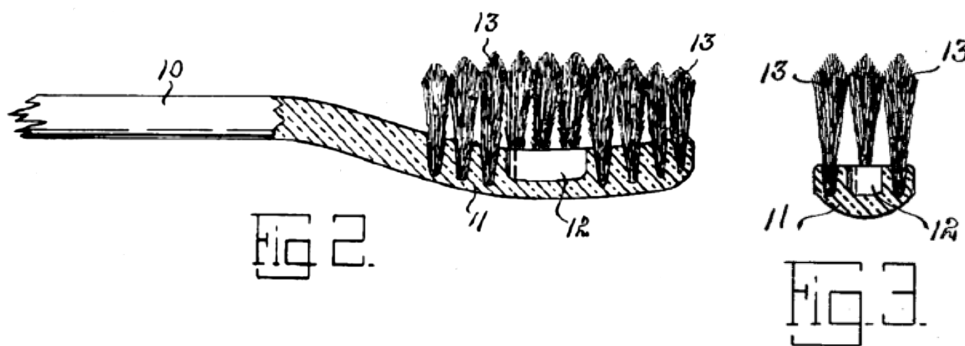
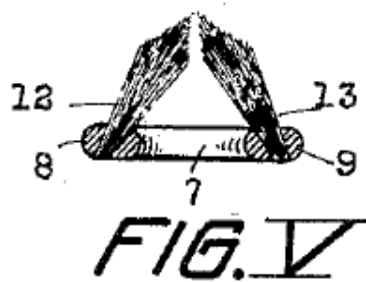


Figure 2 (above left) shows Davidson’s toothbrush in cross-section from the side and Figure 3 (above right) shows it in cross-section from an end view. These figures plainly show a toothbrush having vertical and angled bristles

13 arranged around a dentifrice receiving well 12 for holding any type of dentifrice (including, e.g., a capsule). *See* Ex. 1019, 29:5–12, 39:8–16, 40:1–13, 44:4–20, 47:20–48:5 (Patent Owner’s witness, Mr. Kodama, conceding these facts). As asserted by Petitioner, Davidson’s well 12, illustrated as recessed into the front face of the toothbrush and below the vertical and angled bristles, is useful for retaining dentifrice, “regardless of the type of the dentifrice,” thus, including capsules and pellets as taught by Wolcott. Pet. 34 (citing Ex. 1008 ¶¶ 138–240; Ex. 1010, 3:20–24); Reply 7.

If more were needed to establish that the disputed claimed “angled capsule retaining elements,” i.e., angled bristles, was known and obvious, Petitioner establishes that Fitz-Gibbon is readily combinable with Wolcott (as discussed above) so that Wolcott’s tufts of bristles would have been angled toward the pellet and pellet receiving recess to better hold the pellet, without compromising Wolcott’s method of pellet insertion. Pet. 49–55; *see also* Ex. 1008 ¶¶ 219–222 (explaining this). Fitz-Gibbon’s Figure 5 (below) shows angled bristle tufts of a toothbrush provided to retain dentifrice:



Ex. 1011, Fig. 5. Again, the figure above shows the cross-sectioned end of a toothbrush having tufts of bristles angled inwardly towards one another. Mr. Kodama also concedes that Fitz-Gibbon’s bristles are entire tufts of angled bristles, just as Patent Owner suggests is required of the challenged

claims, which are configured as retaining elements for dentifrice. Ex. 1019, 49:2–10, 50:6–10. Mr. Kodama concedes that Wolcott’s bristles could be (and we find, would have been) so-modified in view of Fitz-Gibbon’s teachings to help retain its dentifrice pellet better without any special engineering abilities beyond that of an ordinarily skilled artisan’s knowledge. *Id.* at 53:1–16; *see also* Hr’g Tr. 33:1–34:2 (Patent Owner was unable to identify any description in the ’332 patent to explain why an oral care capsule could pass past *its invention’s* toothbrush bristles, but would *not* have been able to similarly pass past the bristles of a toothbrush resulting from combining Wolcott and Fitz-Gibbon). Patent Owner concedes that Fitz-Gibbon’s bristles teach the “angled capsule retaining elements” in the way Patent Owner argues the term should be understood, i.e., angled tufts. Hr’g Tr. 38:4–21. Again, we are not persuaded by Patent Owner’s arguments against combining Fitz-Gibbon with Wolcott and Davidson, as discussed above.¹⁷

Regarding challenged dependent claims 2, 5, 6, 12, and 15, we find Petitioner establishes that Wolcott teaches multiple (2, 3 and up to 10 or more) angled capsule retaining elements as pairs or sets of angled bristles, angled toward the center of the capsule receiving zone, and that the bristles flex (a flexural portion) to permit their spreading when the oral care capsule is inserted, thus teaching all these dependent claims require. Pet. 41–44; *see* Ex. 1008 ¶¶ 26, 160–171; 1009, 3:44–67, Figs. 2, 4, 9. Patent Owner does

¹⁷ For these reasons, even if we agreed with Patent Owner’s claim construction arguments addressed in Section II.C (which we do not), we would still find the challenged claims to be unpatentable over the combination of Wolcott and Davidson as modified by Fitz-Gibbon.

not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Regarding challenged dependent claims 7 and 11, we find Petitioner establishes that Wolcott teaches a pair of angled capsule retaining elements (angled bristles) arranged between vertical bristles and the center of a capsule receiving zone, as illustrated in all the Wolcott figures reproduced above, thus teaching all these dependent claims require. Pet. 45; Ex. 1008 ¶¶ 175–176; Ex. 1009, 2:23–24, 2:33–39, Figs. 2, 4. Patent Owner does not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Regarding challenged dependent claims 8 and 13, we find Petitioner establishes Wolcott teaches its dentifrice pellet is a dentifrice composition, thus teaching all these dependent claims require. Pet. 45–46; Ex. 1008 ¶¶ 179–180; Ex. 1009, 1:26–31, 3:18–27. Patent Owner does not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Regarding challenged dependent claims 9 and 14, we find Petitioner establishes Wolcott (and Davidson) teaches an oral care capsule is loaded by inserting it past vertical bristles into a recess, where angled bristles then retain the oral care capsule, thus teaching all these dependent claims require. Pet. 46–47; Ex. 1008 ¶¶ 26, 183–186; Ex. 1009, 3:61–67, Figs. 4, 5; Ex. 1010, 2:11–27. Patent Owner does not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Regarding challenged dependent claims 16 and 17, we find Petitioner establishes Wolcott’s angled bristles (the “angled capsule retaining elements”) overlap a portion of the pellet recess (capsule receiving zone),

thus teaching all these dependent claims require. Pet. 48; Ex. 1008 ¶¶ 26, 190–192; Ex. 1009, Fig. 4. Patent Owner does not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Regarding challenged dependent claim 18, we find Petitioner establishes that Wolcott’s arrangement of angled bristles is such that they are around the perimeter of the capsule/pellet recess and some (at least 3) are at least 144° apart from one another, thus teaching all this claim requires. Pet. 48–49; Ex. 1008 ¶¶ 26, 194–198; Ex. 1009, Fig. 2. Patent Owner does not (substantively) argue otherwise. *See* Resp. 18–20, 29–31, 33–36; *see generally* Sur-reply.

Patent Owner’s arguments about objective indicia of non-obviousness are not persuasive. As noted above, they are vague and ambiguous and lack specificity. The only expressly alleged objective indicium is that the invention satisfies some long-felt and unsatisfied need. *See* Resp. 36–39; *see also* Hr’g Tr. 39:13–18, 40:14–19 (Patent Owner confirming this is the only secondary consideration issue, other than some un-briefed, “non-conclusive evidence of copying”). However, Patent Owner did not argue (except in passing at the final hearing) that there was any specific long-felt need that went unmet until the claimed invention or, for that matter, that the invention satisfied any specific need. *See Sjolund v. Musland*, 847 F.2d 1573, 1582 (Fed. Cir. 1988) (a proponent of objective evidence of long-felt need must show that “the *claimed invention* satisfied a long felt need”); Resp. 36–39.

Furthermore, objective evidence of non-obviousness “is only relevant to the obviousness inquiry ‘if there is a nexus between the claimed invention and the [objective indicia of non-obviousness].’” *In re Affinity Labs of*

Tex., LLC, 856 F.3d 883, 901 (Fed. Cir. 2017) (quoting *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (2006)). Patent Owner does not attempt to establish a nexus between the claimed invention and any long-felt need, alleging only that *Petitioner asserts* that Sorrentino (Ex. 1013) discloses the claimed invention, and then Patent Owner suggests a Colgate-marketed product, that may be disclosed in Sorrentino, meets *some* unidentified need. Resp. 36–39; *Fox Factory*, 944 F.3d at 1373. Patent Owner has not made a sufficient showing to persuade us that there was either a long-felt need or any need that was met by the claimed invention. See Reply 17, 22–24. Thus, we accord no weight to Patent Owner’s argument on objective indicia of non-obviousness. In any event, even if the alleged objective indicium were entitled to some weight, we find that the evidence of obviousness on this record is quite strong and substantially outweighs any indicia of non-obviousness on this record. *Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1372 (Fed. Cir. 2007) (“Although secondary considerations must be taken into account, they do not necessarily control the obviousness conclusion.”).

3. Summary

Based on the parties’ arguments and the record, as discussed above, Petitioner has shown under Grounds 1 and 2 that challenged claims 1, 2, and 5–18 of the ’332 patent would have been obvious over Wolcott and Davidson, and over Wolcott, Davidson, and Fitz-Gibbon.

G. GROUNDS 3 AND 4—OBVIOUSNESS OVER YOUNG, DAVIDSON, AND FITZ-GIBBON

Similar to Grounds 1 and 2, discussed above, we find the facts and allegations under Ground 4 include those of Ground 3, and that Patent

Owner's positions opposing Grounds 3 and 4 substantially overlap. *See* Pet. 58–92; Resp. 17–18, 21–36. Thus, we discuss the two grounds together.

1. Parties' Positions

Under Grounds 3 and 4, Petitioner challenges independent claims 1 and 10, and their dependent claims 2, 5–9, and 11–18 as obvious over Young and Davidson, and over these two references also combined with Fitz-Gibbon (much as Wolcott and Davidson and Fitz-Gibbon were so-combined under Grounds 1 and 2). Pet. 58–92 (citing, *inter alia*, Ex. 1008 ¶¶ 26, 241–250, 252–262, 264–271, 275–281, 284–288, 290–292, 295–296, 289–300, 303–304, 307–310, 313–315, 317–325, 327–328, 330–343, 345, 347–349, 352–355, 358–360; Ex. 1010, 1:1–10, 1:51–55, 2:11–27, 3:20–24, Figs. 1–3; Ex. 1011, 1:58–67, Figs. 3, 5; Ex. 1012, 1:3–9, 1:36–40, 1:50–2:4, 2:21–34, Figs. 1, 7–11).

Petitioner's positions are basically the same under Grounds 3 and 4 as they were under Grounds 1 and 2, but with Young replacing Wolcott, as Young also teaches a toothbrush having angled bristles (like Wolcott's) surrounding a circular pocket for retaining a dentifrice pellet. *Id.* at 58–92. Petitioner asserts that, like Wolcott, Young is directed to a toothbrush with a dentifrice pellet receiving zone in a bristle pocket and, so, the same motivations would lead the ordinarily skilled artisan to combine Young's teachings with those of Davidson and Fitz-Gibbon under Grounds 3 and 4 as found for Grounds 1 and 2; that is, each reference is focused on better holding dentifrice in a pocket on a toothbrush and one reference's advantageous elements would also serve the other's. *Id.* at 58–62, 83–85 (citing Ex. 1008 ¶¶ 241–250, 322–325, 327–328, 330; Ex. 1010, 1:1–10,

1:51–55, 3:20–24, Figs. 1, 2; Ex. 1011, 1:58–67, 1:79–87, Figs. 3, 5;
Ex. 1012, 1:45–50, 2:21–34, Figs. 4, 7–11).

Again, Petitioner maps the teachings of the prior art to the elements of challenged independent claims 1 and 10, and dependent claims 2, 5–9, and 11–18, and asserts that the disclosed features of prior art toothbrushes meet the elements of the claims and, in particular, that bristles of Young are angled toward, are diametrically opposing (and at least 108° or 144° apart), and surround and define a dentifrice receiving recess (so as to provide “angled capsule retaining elements”), that Davidson teaches a fully-recessed well in a toothbrush head for a dentifrice receiving zone, and, if more were needed, that the bristle tufts of Fitz-Gibbon are entirely angled around and toward a dentifrice holding zone to better retain dentifrice inserted therein such that, when the teachings of the references are combined, they render the totality of each challenged claim obvious. Pet. 62–82, 85–92 (citing Ex. 1008 ¶¶ 26, 252–262, 264–288, 290–292, 295–296, 298–300, 303–304, 307–310, 313–315, 317–321, 331–343, 345, 347–349, 352–355, 358–360; Ex. 1010, 1:1–27, 1:51–55, 3:20–29, Figs. 1–3; Ex. 1011, Figs. 3, 5; Ex. 1012, 1:3–9, 1:45–2:4, 2:21–40, Figs. 1, 2, 7–11).

Regarding challenged independent claims 1 and 10, Petitioner asserts Young teaches the claimed toothbrush with a head and a front and back surface, and with vertical bristles. See Pet. 61–65. None of these things is in dispute. See *generally* Resp. Further, Petitioner asserts Young (at each figure showing Young’s toothbrush) teaches a capsule receiving zone, which is a pocket for a dentifrice pellet, and is surrounded by many angled bristles (the claimed “angled capsule retaining elements”), which are elevated above and canted toward the pellet pocket and engage/contact and retain the

dentifrice pellet (the claimed “oral care capsule”) on diametrically opposing sides (or at least 108° apart). Pet. 65–75. Petitioner again points to Davidson as teaching a recessed well to hold dentifrice as the claimed “recess defined in the front surface.” *Id.* at 66–68. Moreover, to the extent necessary, Petitioner also points to Fitz-Gibbon’s teaching of angled tufts of bristles as the “angled capsule retaining elements.” *Id.* at 85–89.

Again, Petitioner accounts for each added element of each of challenged dependent claims 2, 5–9, and 11–18 as taught in or suggested by the asserted prior art. *See* Pet. 75–83, 89–92 (citing Ex. 1008 ¶¶ 26, 284–288, 290–292, 295–296, 298–300, 303–304, 307–310, 313–315, 317–321, 334, 345, 347–349, 352–355; Ex. 1010, 2:11–27, Figs. 1–3; Ex. 1011, Figs. 3, 5; Ex. 1012, 1:45–2:4, 2:26–29, 2:21–29, 2:31–34, Figs. 2, 7–11). To summarize, covering the challenged dependent claims, Petitioner asserts: Young teaches (and largely Davidson, too) angling bristles toward the center of a capsule receiving zone; a flexural portion permits the insertion of a dentifrice capsule/pellet into a receiving zone; dentifrice pellets/capsules are inserted downwardly past angled and vertical bristles, spreading them apart, and that they then spring back; several angled bristles (at least three, but really more) are provided; angled bristles are between vertical ones and a center of a capsule receiving zone; angled bristles overlap part of a capsule receiving zone; and angled bristles are provided at least 144° apart from one another around a capsule receiving zone. *Id.* Moreover, Petitioner asserts Fitz-Gibbon also teaches all the dependent claim elements directed to “angled capsule retaining elements” (i.e., angled bristles). *Id.*

Patent Owner attacks Young as teaching an embodiment where dentifrice is inserted into a space in its bristles from the back of the

toothbrush, arguing that this, as in Fitz-Gibbon, is the opposite of, and teaches away from, what is required by the challenged claims. Resp. 17–18, 21, 26 (citing Ex. 2001 ¶¶ 72–73, 81–82, 97; Ex. 1012, 2:43–45, Figs. 8, 9); *see also* Sur-reply 15–16, 22. Patent Owner also argues that Young’s other embodiment (where a dentifrice is inserted through bristles from the front) does not teach bristles that retain dentifrice, but “only prevent it from rolling away” because the dentifrice is “only balanced . . . on top of . . . shorter bristles,” in a “space between the longer bristles . . . with no overhanging angled bristles.” Resp. 21 (citing Ex. 2001 ¶ 81).

Patent Owner argues “[t]here is no motivation to combine Davidson and Young” because Young requires “a hole in the head of the brush which would dump the [Davidson] powder out.” Resp. 21–22 (citing Ex. 2001 ¶¶ 84–90). Patent Owner again argues Davidson’s focus on powder dentifrice is an issue, similar to its (above-rejected) arguments over Grounds 1 and 2. *Id.* at 22–23. Patent Owner makes a similar argument against combining Fitz-Gibbons (powder dentifrice) with Young. *Id.* at 25 (citing Ex. 1011, 2:84–87; Ex. 2001 ¶¶ 95–96).

Patent Owner argues that neither Young nor Davidson teaches angled bristles, similar to its (above-rejected) arguments over Grounds 1 and 2. Resp. 22, 24 (citing Ex. 2001 ¶¶ 85, 92); *see also* Sur-reply 19–20. Patent owner points to Davidson disclosing “bristles that surround the well 2 extend **at right angles from the head**,” and Young disclosing “[s]aid tufts being disposed in **parallel**, longitudinal and transverse rows,” as support. *Id.* at 24 (citing Ex. 1010, 2:3–5; Ex. 1012, 2:43–45).

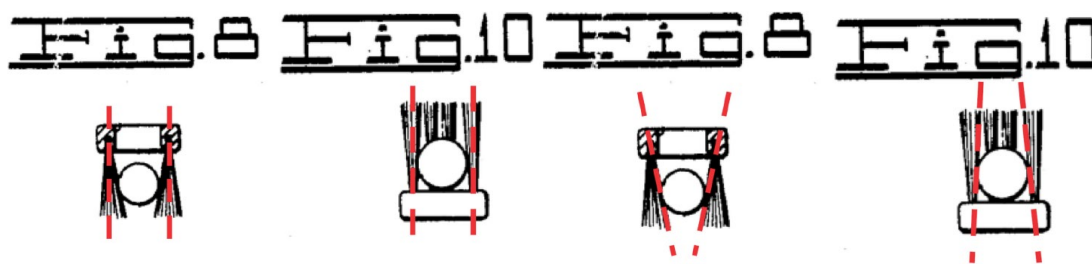
Finally, Patent Owner’s arguments and assertions relating to objective indicia of non-obviousness also apply to Grounds 3 and 4; however, we have

already addressed this as unpersuasive, as explained above, and find that the alleged objective indicia remain unpersuasive for Grounds 3 and 4 as well.

2. Analysis

We again agree with Petitioner's positions and again do not find any argument by Patent Owner to be persuasive. Petitioner has sufficiently and accurately mapped the limitations of the claims to the disclosures of Young, Davidson, and Fitz-Gibbon, identified reasons with rational underpinnings why the ordinarily skilled artisan would have combined the teachings of the references, and shown that there would have been a reasonable expectation of success.

The primary dispute over Grounds 3 and 4 is, again, whether the prior art teaches angled bristles (the "angled capsule retaining elements"). We find the facts under Grounds 3 and 4 relating to Young similar to those of Grounds 1 and 2 regarding Wolcott, as discussed above. Petitioner provides annotated versions of Young's Figures 8 and 10 that we agree illustrate how Young's bristles are vertical and also angled to retain a dentifrice pellet. We reproduce these annotated figures below:



By annotation (red dashed lines), Figures 8 and 10 (two at left) highlight vertical bristles and also angled bristles (two at right) surrounding a dentifrice pellet, retaining it in a pocket (both from below and from above, regardless of how the toothbrush is oriented). *See* Pet. 69; Ex. 1008 ¶¶ 26,

254, 266–267. We agree with Petitioner’s understanding of Young and that it teaches the claim elements, including the “angled capsule retaining elements.” Granted, Young’s Figure 8 relates to the embodiment of the reference that Patent Owner takes issue with—one with a hole in the back of the toothbrush’s head for inserting the dentifrice capsule, but Figure 10 does not relate to such an embodiment and has no hole. For Figure 10’s embodiment, “bristles in the center of the [tooth]brush at one end are omitted thus forming a pocket 32 in which the pellet 16 will be retained in place by the resiliency of the bristles.” Ex. 1012, 2:30–34; Ex. 1008 ¶ 242 (Mr. Fletcher discussing this same passage of Young); *see also* Ex. 1019, 58:9–14, 58:25–59:5 (Q. “And do you agree that Figure 8 [of Young] shows that it is the splaying out of the bristles that is preventing the dentifrice pellet from just falling through the front of the brush, the bottom side of the brush in Figure 8?” A. “Yes, I believe that’s what Figure 8 is trying to show.” Q. “Okay. And so at least in the position shown in Figure 8, the angled bristles are retaining the capsule in place, agreed?” A. “That’s what’s being shown in Figure 8, yes.”). We see little meaningful difference between the two embodiments in terms of how their bristles function and are configured. Petitioner’s expert testified that the annotated figures above teach the claimed “angled capsule retaining elements,” defining a pocket for a pellet, diametrically opposed (or otherwise separated by claimed degrees) angled bristles, canted towards the pocket and contacting the dentifrice pellet. Ex. 1008 ¶¶ 26, 256–281.

We agree with Petitioner’s position, as supported by Mr. Fletcher’s testimony (and Mr. Kodama’s concessions upon cross-examination), that the combined teachings of Young and Davidson teach an oral capsule receiving

zone defined by angled bristles, and that a dentifrice pellet would be inserted into a recess in the toothbrush's surface in that zone, past the vertical and angled bristles and that, once inserted, the angled bristles engage and retain the dentifrice pellet. Ex. 1008 ¶¶ 260–281; *see also* Ex. 1019 60:14–18, 61:25–62:3 (Mr. Kodama again conceding that Young teaches angled bristles that help retain the dentifrice pellet). Patent Owner's argument (*see* Resp. 23) that this combination “would not allow for an oral care capsule to be inserted past the vertical bristles because Young teaches insertion from the back,” makes little sense in view of Young's embodiments without a back opening, where there would be no other way to insert a dentifrice pellet other than insertion from the front past the vertical and angled bristles. *See, e.g.*, Ex. 1008 ¶¶ 261–252; *see also id.* ¶¶ 307–309.

We also agree with Petitioner that it would have been obvious to combine Young, Davidson, and Fitz-Gibbon. Each is directed to using a toothbrush's bristles to retain dentifrice; each uses some form of angled bristles to do this. *See* Ex. 1012, Figs. 8–11; Ex. 1011, Figs. 3, 5. We are not persuaded by Patent Owner's arguments that the rear opening in Young would dissuade from such a combination because Young includes other embodiments. *See, e.g.*, Ex. 1012, Figs. 1, 2, 10, 11. We are not persuaded by Patent Owner's argument that Davidson is focused on dentifrice powder because, as discussed above, Davidson is explicit that its toothbrush will work with any type of dentifrice. Ex. 1010, 3:20–24. We are not persuaded by Patent Owner's argument that Young's bristles only serve to keep a pellet from “rolling away,” as there is no indication of this, but quite the opposite as evidenced by Mr. Kodama's concession that Young teaches angled bristles that help retain the dentifrice pellet (and Young's illustrations of

bristles retaining a pellet when the toothbrush is inverted). Ex. 1019 60:14–18, 61:25–62:3; *see also* Ex. 1012, 2:30–34 (disclosing *retaining* the pellet in the pocket by the resiliency of the bristles), Fig. 8 (showing a pellet retained in the pocket even upon inverting the toothbrush).

As discussed above, Mr. Kodama concedes that Fitz-Gibbon’s bristles are entire tufts of angled bristles, just as Patent Owner proposes is required, which are configured as retaining elements for dentifrice, and that “no great engineering” would have been required to so-angle tufts of bristles on a toothbrush like Young’s (like Wolcott’s) to help hold dentifrice. Ex. 1019, 49:2–10, 50:6–10; 53:8–16. Thus, upon combining Young, Davidson, and Fitz-Gibbon, all challenged claim elements are taught in the prior art.

Turning to the challenged dependent claims, and beginning with dependent claims 2, 5, 6, 12, and 15, we find Petitioner establishes that Young teaches multiple (2, 3 and up to 14 or more) angled capsule retaining elements as pairs or sets of angled bristles, angled toward the center of the capsule receiving zone, and that the bristles flex (a flexural portion) to permit their spreading when the oral care capsule is inserted, thus teaching all these dependent claims require. Pet. 75–78, 89–91; *see* Ex. 1008 ¶¶ 26, 284–288, 290–292, 295–296, 334, 345–355; Ex. 1011, Figs. 3, 5; Ex. 1012, 2:26–29, 2:31–34, Figs. 1, 7–11. Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

Regarding dependent claims 7 and 11, we find Petitioner establishes that Young teaches a pair of angled capsule retaining elements (angled bristles) arranged between vertical bristles and the center of a capsule receiving zone, as illustrated in all of Young’s figures reproduced above (and Figure 9), thus teaching all these dependent claims require. Pet. 78;

Ex. 1008 ¶¶ 26, 298–300, 334; Ex. 1012, Figs. 8–10. Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

Regarding dependent claims 8 and 13, we find Petitioner establishes Young teaches its dentifrice pellet is a dentifrice composition, thus teaching all these dependent claims require. Pet. 79; Ex. 1008 ¶¶ 303–304, 334; Ex. 1012, 1:6–9, 1:50–2:4. Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

Regarding dependent claims 9 and 14, we find Petitioner establishes the Young and Davidson combination teaches an oral care capsule is loaded by inserting it past vertical bristles into a recess, where angled bristles then retain the oral care capsule, thus teaching all these dependent claims require. Pet. 79–80, 90–91; Ex. 1008 ¶¶ 307–310, 352–355; Ex. 1010, 2:11–27, Figs. 1–2; Ex. 1012, 1:45–50, 2:21–34, Figs. 1, 2, 7–10. We agree with Petitioner that “[t]ilting the bristles as taught by Fitz-Gibbon would still allow this front-loading of the pellet, such as by spreading the bristles.” Pet. 90 (citing Ex. 1008 ¶ 352). Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

Regarding dependent claims 16 and 17, we find Petitioner establishes Young’s (and Davidson’s and Fitz-Gibbon’s) angled bristles (the “angled capsule retaining elements”) overlap a portion of the pellet recess (capsule receiving zone), thus teaching all these dependent claims require. Pet. 80–81, 91; Ex. 1008 ¶¶ 26, 313–315, 358–360; Ex. 1010, Fig. 3; Ex. 1011, Fig. 5; Ex. 1012, Figs. 8, 10. Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

Regarding dependent claim 18, we find Petitioner establishes that Young's arrangement of angled bristles is such that they are around the perimeter of the capsule/pellet recess and some (at least 3) are at least 144° apart from one another, thus teaching all this claim requires. Pet. 81–82, 92; Ex. 1008 ¶¶ 26, 317–321, 334; Ex. 1012, Figs. 2, 7, 9. Patent Owner does not (substantively) argue otherwise. *See* Resp. 23–26, 29–31, 33–36; *see generally* Sur-reply.

3. Summary

Based on the parties' arguments and the record, as discussed above, Petitioner has shown under Grounds 3 and 4 that challenged claims 1, 2, and 5–18 of the '332 patent would have been obvious over Young and Davidson, and over Young, Davidson, and Fitz-Gibbon.

H. GROUND 5 AND 6—OBVIOUSNESS OVER SORRENTINO AND FITZ-GIBBON

Petitioner states, “[b]ecause Grounds 1-4 render the '332 Patent unpatentable, the Board need not reach Grounds 5-6.” Reply 26. We agree.

Petitioner's Grounds 5 and 6 are each foundationally based on obviousness over Sorrentino. Pet. 83–111. As discussed above, the matter of whether Sorrentino is prior art is disputed. *See supra* Section II.E. Because we determine, as discussed above, that Petitioner establishes the unpatentability of all challenged claims under Grounds 1–4, we do not reach Grounds 5 and 6 as it is unnecessary to our final conclusions in this proceeding. *See supra* Sections II.F and II.G; *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. 2020) (nonprecedential) (“[T]he Board has discretion to decline to decide additional instituted grounds once petitioner has prevailed on all its challenged claims.”); *Beloit Corp. v.*

Valmet Oy, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (once a dispositive issue is decided, there is no need to decide other potentially dispositive issues).

III. CONCLUSION¹⁸

On the record before us, we conclude that Petitioner demonstrates by a preponderance of the evidence that all challenged claims of the '332 patent are unpatentable under Grounds 1–4 as obvious over Wolcott and Davidson, Wolcott, Davidson, and Fitz-Gibbon, Young and Davidson, and Young, Davidson, and Fitz-Gibbon. Accordingly, claims 1, 2, and 5–18 of the '332 patent are unpatentable under 35 U.S.C. § 103.

¹⁸ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

Our final decision is summarized as follows:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 2, 5–18	103	Wolcott, Davidson	1, 2, 5–18	
1, 2, 5–18	103	Wolcott, Davidson, Fitz-Gibbon	1, 2, 5–18	
1, 2, 5–18	103	Young, Davidson	1, 2, 5–18	
1, 2, 5–18	103	Yong, Davidson, Fitz-Gibbon	1, 2, 5–18	
1, 5, 7–11, 13–18	103	Sorrentino ¹⁹		
1, 2, 5–18	103	Sorrentino, Fitz-Gibbon ²⁰		
Overall Outcome			1, 2, 5–18	

ORDER

Accordingly, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314, per *inter partes* review of claims 1, 2, and 5–18 of the '332 patent, they are 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.

¹⁹ We do not reach this ground because the claims addressed by the ground are found unpatentable as obvious on other grounds.

²⁰ We do not reach this ground because the claims addressed by the ground are found unpatentable as obvious on other grounds.

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