

**UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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ASCENTCARE DENTAL PRODUCTS, INC.,  
Petitioner

v.

SOLMETEX, LLC  
Patent Owner

Patent No. 11,589,969

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Case No. IPR2025-01020

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**LISTING OF EXHIBITS**

<b>Exhibit No.</b>	<b>Description</b>
2001	U.S. Patent Publication No. 2009/0274991 to Black
2002	U.S. Patent No. 1,731,322 to Riddle ("Riddle")
2003	U.S. Patent No. 4,083,115 to McKelvey ("McKelvey")
2004	International Publication No. WO 2011/014952 to Maycher ("Maycher")
2005	U.S. Patent Publication No. 2006/0063129 to Hirsch ("Hirsch '129")
2006	Patent Owner's May 17, 2023 Infringement Notice Letter to Petitioner
2007	First Case Management Order, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, ECF No. 20 (Apr. 22, 2025)
2008	Defendant/Counter-Plaintiff Ascentcare Dental Products, Inc.'s Brief in Support of Motion to Stay, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, ECF No. 38 (Jul. 11, 2025)
2009	Declaration of Nathan P. Sportel in Support of Defendant/Counter-Plaintiff's Motion to Stay, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, ECF No. 39 (Jul. 11, 2025)
2010	Plaintiff/Counter-Defendant Solmetex, LLC's Opposition to Ascentcare's Motion to Stay, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, ECF No. 41 (Jul. 25, 2025)
2011	Defendant/Counter-Plaintiff Ascentcare Dental Products,

	Inc.’s Invalidity Contentions Cover Pleading, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, served July 18, 2025
2012	Defendant/Counter-Plaintiff Ascentcare Dental Products, Inc.’s Invalidity Contentions Claim Chart for the ‘969 Patent, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, served July 18, 2025
2013	DocketNavigator Statistics, Western District of Michigan
2014	Email dated June 3, 2025 from Counsel for Solmetex to Counsel for Ascentcare
2015	Defendant/Counter-Plaintiff Ascentcare Dental Products, Inc.’s Non-Infringement Contentions, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, served July 18, 2025
2016	Declaration of Professor Charles A. Garris, Ph.D.
2017	<i>Curriculum vitae</i> of Professor Charles A. Garris, Ph.D.
2018	DryShield User Guide
2019	Petition for <i>Inter Partes</i> Review of U.S. Patent No. 12,290,418 (IPR2025-01175)
2020	Merriam-Webster Dictionary (“wave”)
2021	Merriam-Webster Dictionary (“crest”)
2022	Merriam-Webster Dictionary (“trough”)
2023	Dow Chemical Company, Silicone Rubber Selection Guide
2024	Excerpt from Ascentcare’s Proposed Claim Constructions and Extrinsic Evidence, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, served Sept.

	16, 2025
2025	Excerpt from Solmetex's Preliminary Proposed Claim Constructions and Identification of Extrinsic Evidence, <i>Solmetex, LLC v. Ascentcare Dental Products, Inc.</i> , Case No. 1:24-cv-00954-RJJ-MV, served Sept. 16, 2025
2026	Excerpts from Prosecution History of U.S. Patent No. 11,744,686 (Ex. 1020 in IPR2025-01059)

Solmetex, LLC ("Patent Owner") submits this Preliminary Response under 37 C.F.R. § 42.207 to the Petition for *Inter Partes* Review ("Petition") of U.S. Patent No. 11,589,969 ("the '969 Patent"), filed by Ascentcare Dental Products, Inc. ("Petitioner" or "Ascentcare").

## **I. INTRODUCTION**

Patent Owner respectfully requests that the Board deny institution because Petitioner has not shown any challenged claim of the '969 Patent is unpatentable in relation to any ground raised in the Petition.

Petitioner did not meet its burden for Grounds 1 and 5 because Black fails to disclose the claimed "bridge structure," which includes a plurality of protrusions that "protrude from the interior surface of the second wall toward the first wall in a wave shape comprising one or more crests and one or more troughs." The Office repeatedly and consistently found that Black does not disclose this feature during prosecution of the '969 Patent and its parent application. The prosecution history makes clear that the claimed "wave shape" distinguishes the claimed inventions from Black's rectangular protrusions. In an effort to relitigate the Office's prior findings, Petitioner advances an overbroad interpretation of this limitation that effectively reads out the "wave shape" requirement. Petitioner's interpretation cannot be correct and should be rejected.

Petitioner similarly did not meet its burden for Grounds 2-4, which rely on a combination of three references (Park, Baughan, and Johnson), because Petitioner's proposed combination does not contain a "bridge structure" for the same reasons that Black does not. Thus, adopting Patent Owner's construction for the "bridge structure" limitation is dispositive for Grounds 1-5 and warrants denial of the Petition. In any event, Petitioner's alleged motivation to modify Park is flawed. Petitioner argues that a POSITA would add a "bridge structure" to Park because Park's mouthpiece comprises a flexible material and would therefore collapse under suction. But there is no evidence that this problem exists in Park. In fact, Petitioner's own evidence shows that there is no such problem in Park.

For example, Petitioner argues that Park's walls would collapse under suction because comprise a silicone material but later argues that the same silicone material can constitute an "anti-collapse structure." As another example, Petitioner shows similar mouthpieces (Hirsch and Isolite) that, under its reasoning, would have the same or greater problem with their walls collapsing under suction, yet have no "bridge structure." Petitioner's obviousness theory is also flawed because it suggests that Park would not work for its intended purpose unless modified to include a "bridge structure," even though Park is presumed to be operable.

Petitioner has not identified any prior art to the '969 Patent that discloses or suggests that two walls in a dental isolation mouthpiece would collapse under

suction. Instead, Petitioner's obviousness argument used the '969 Patent's teaching that the "bridge structure" can prevent walls from collapsing as a blueprint for its proposed combination. The Board should reject this hindsight reconstruction. Additionally, Petitioner's translation of Park (a Korean reference) does not comply with the Board's rules, which is yet another basis for denying the Petition.

The Petition contains additional flaws that warrant denial. First, the Petitioner does not propose any claim constructions. This is problematic because Petitioner says that it applied Patent Owner's "implied constructions" for Ground 1 and Petitioner's constructions for Ground 2. But the Petitioner does not tell the Board what these constructions are. Compounding the problem, Petitioner just recently served proposed claim construction for claim 19 of the '969 Patent in the Parallel Litigation, but it is unclear whether these are the constructions that the Petition is referring to for Ground 2. Patent Owner submits that the Petitioner should be denied for failure to comply with 37 C.F.R. § 42.104(b)(3).

Petitioner's expert testimony is also flawed. According to Petitioner, a POSITA would have at least a bachelor's in mechanical engineering. Dr. Black is a dentist and does not possess an engineering degree and, tellingly, proposes a different definition for a POSITA than the Petition. Moreover, Dr. Black is the author of the Black reference used in Ground 1. While that alone is not necessarily problematic, at various points in his declaration, he strays beyond offering objective

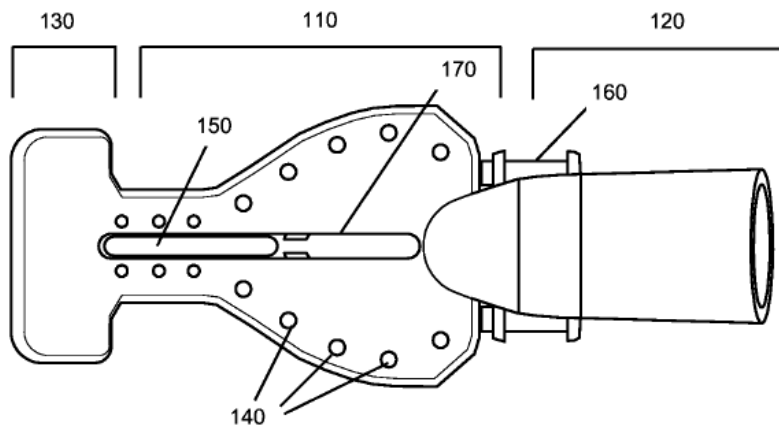
expert testimony and purports to testify as to his own intent and state of mind when writing Black. This is improper because expert testimony regarding patentability should be framed from the perspective of an objective POSITA, not the subjective views of the inventor of a piece of prior art.

## **II. OVERVIEW OF THE '969 PATENT**

The '969 Patent is directed to a dental isolation mouthpiece. EX1001, 1:16-18. As explained in the background section, at the time of the invention, “[v]arious mouthpieces . . . [were] used by dental health professionals, dental hygienists, and dental assistants.” EX1001, 1:20-22; EX2016, ¶33. Traditionally, dental procedures are performed by “a two-person team that comprises a dental professional and a dental assistant” and used “many different types of dental equipment and materials.” EX1001, 1:22-34; EX2016, ¶33. By using a two-person teams, the dental assistant can “assist the dental professional in coordinating the use of these multiple items of different equipment and materials.” EX1001, 1:34-37.

While other mouthpieces were in the marketplace at the time of the invention, the inventors recognized “a need in the art for improved systems and methods of providing dental services in a more efficient, comfortable, and safe manner to the dental patient.” EX1001, 1:38-40; EX2016, ¶34. To that end, the '969 Patent discloses “a mouthpiece that may be attached to a high-suction dental adapter for the purpose of assisting the dental staff during dental procedures through chair-side,

hands-free suction, and isolation.” EX1001, 1:44-48. In the illustrated embodiment, the mouthpiece includes a main body portion 110, a suction connector portion 120, and a check retractor portion 130. EX1001, 3:19-25; EX2016, ¶34.



EX1001, FIG. 1B

The main body portion 110 “may include an anterior wall facing the front of the mouth (e.g., the side with slit 170) and a posterior wall facing the back of the mouth.” EX1001, 3:44-47; EX2016, ¶35. These walls “may serve to protect and separate the top of the mouth and the bottom of the mouth/tongue” and “protect the back of the mouth (e.g., throat and airway) from falling debris.” EX1001, 3:7-62; EX2016, ¶35.

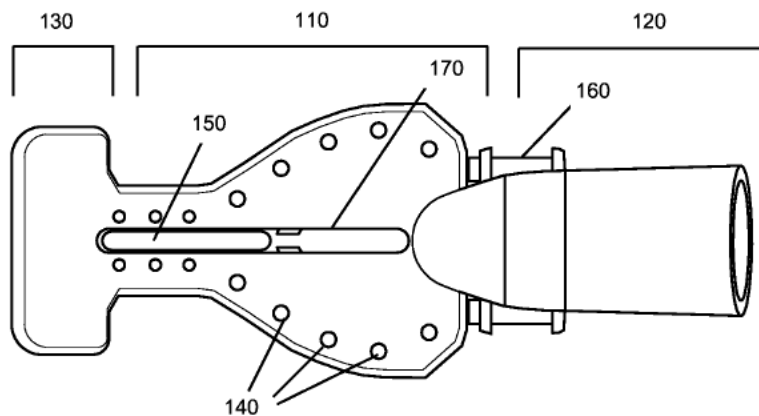
“When placed in a patient’s mouth, the suction connector portion may protrude from one side of the patient’s mouth, while the main body portion 110 lies against the back of the patient’s mouth, and the cheek retractor portion 130 retracts the patient’s cheek on the opposite side of the patient’s mouth.” EX1001, 3:32-39;

EX2016, ¶36. An illustration of how the mouthpiece fits into the patient's mouth is shown below:



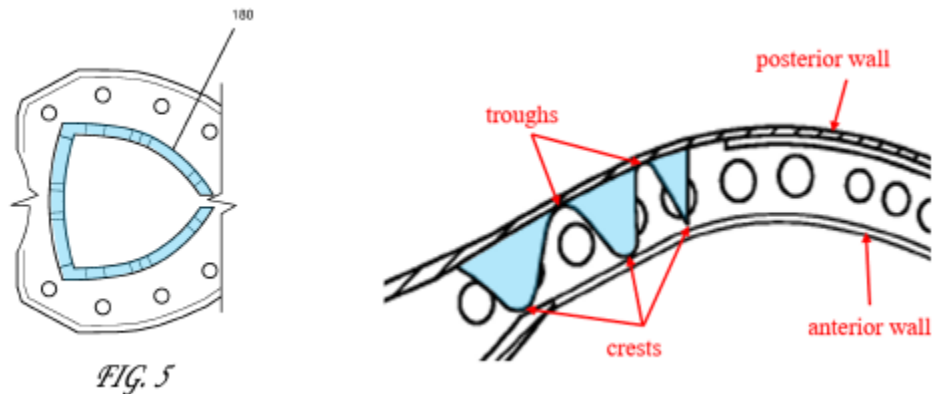
EX2018

To perform the function of suctioning fluids while positioned within the mouth, the main body portion 110 includes perforations 140 or holes that “assist in suctioning of water, saliva and debris from the oral cavity.” EX1001, 4:4-8; EX2016, ¶37. The open slit 170 on the flexible wall may also assist in the suctioning “of water, saliva and debris.” EX1001, 4:39-45; EX2016, ¶37.



EX1001, FIG. 1B

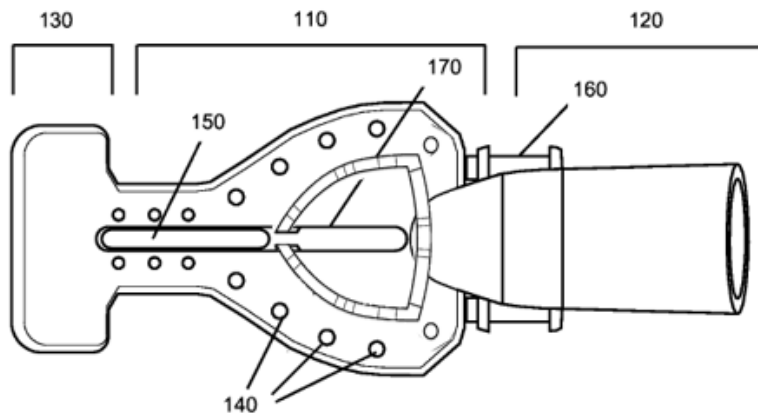
When the suctioning force is applied to the mouthpiece during operation, given the particular design (including the presence of the open slit 170), the opposing anterior and posterior surfaces of the main body 110 could collapse on each other, thereby limiting the suctioning through the perforations 140. EX2016, ¶38. To prevent that problem, a bridge structure 180 is formed “on an interior surface [of the main body 110] to ensure that the anterior and posterior surfaces remain separated during suction.” EX1001, 4:46-49; EX2016, ¶38. FIG. 5 shows a “close-up view of the bridge structure 180” while FIG. 1E is a cross-sectional view that shows the bridge structure 180 formed on the interior surface of upper wall of the main body 110 and protruding toward the lower wall:



EX1001, FIGS. 5, 1E (annotated)

As shown below where FIG. 5 is superimposed on top of FIG. 2B, the bridge structure 180 is positioned in the area of the open slit 170 with portions of the bridge

structure 180 near some of the perforations 140 that follow the edges of the main body 110. EX2016, ¶¶39-41.

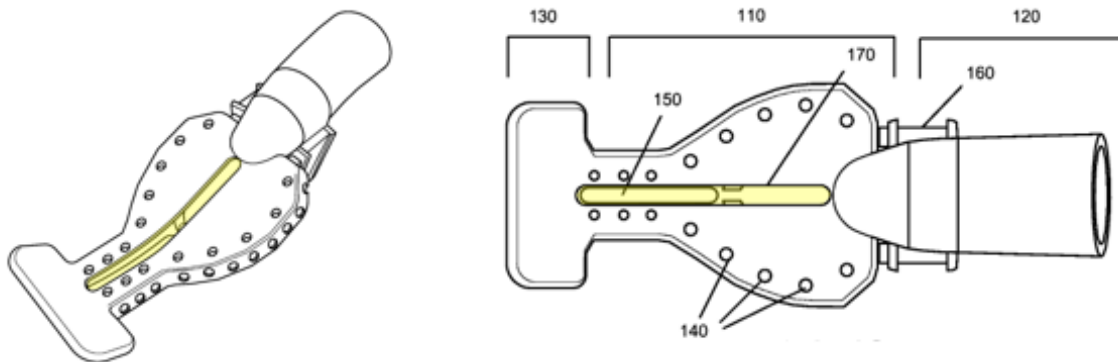


EX1001, FIGS. 1B and 5 (superimposed)

As shown in FIGS. 1E and 2E, the bridge structure 180 is “formed as a[] wave-like protrusion that generally corresponds to the distance between the anterior and posterior walls extending substantially (e.g., within 1 mm) the full distance at its crest and substantially flush to the surface at its trough.” EX1001, 4:52-57; EX2016, ¶42. Within this wave-like structure, “[t]he crests provide a plurality of contact points with the anterior wall to keep the anterior wall separated from the posterior wall during suction [while] the troughs provide gaps that allow for suction of air, fluids, and small debris through the bridge structure.” EX1001, 2:16-22; EX2016, ¶42. The geometry of the bridge structure 180 is important during operation because “[t]he gaps (or troughs) between the waves of the bridge structure 180 assist in the suction-driven transfer of water and saliva to the suction connector portion 120,”

which is “configured to attach to a high-suction vacuum adapter and to assist in transferring water, saliva, and debris from the oral cavity to the external adapter for removal” from of the patient’s mouth. EX1001, 4:59-6, 5:1-5; EX2016, ¶42.

The ‘969 Patent teaches that the mouthpiece can be made of “a high heat-resistant and autoclavable material” so that the “mouthpiece may be reusable.” EX1001, 1:57-59. The term “autoclavable” refers to the ability to clean and sterilize the equipment. EX2016, ¶43. As an additional benefit, because the wave-like protrusions are formed on the interior surface of only one wall of the main body 110, the walls can still be pulled away from each other to permit access into the interior space, for example, to allow for cleaning. EX1001, 4:39-45; EX2016, ¶43. In addition to allowing suctioning of materials therethrough, the open slit 170 also permits access between the walls to “assist in cleaning and maintenance.” EX1001, 4:39-45; EX2016, ¶44.



EX1001, FIGS. 1A-1B (annotated)

For example, one could insert a brush in the interior of the main body 110 through the open slit 170 for cleaning after patient use. EX2016, ¶44.

The fact that the wave-like protrusions of the bridge structure 180 are formed on only one wall (not both walls) of the main body 110 also provides additional flexibility to the mouthpiece, which is helpful when attempting to position the mouthpiece within the patient's mouth. EX2016, ¶45. In other words, if the bridge structure 180 were to be connected to both walls, the main body 110 would be more rigid and more resistive of torsional forces when attempting to twist the mouthpiece into the proper position. *Id.*

In summary, because the wave-shaped protrusions of the bridge structure 180 are formed on only one wall (not both walls) of the main body 110, the main body 110 is more flexible and the walls can be pulled apart from each other to allow access into the interior space for maintenance or cleaning. EX2016, ¶46. During operation when suction forces are applied, the wave-shaped protrusions keep the two walls separated from each other using the contact points at the crests of the wave-shaped protrusions, thereby permitting the suction of air, fluids, and small debris through the troughs between the crests of the wave-shaped protrusions. EX1001, 2:16-22; EX2016, ¶46.

### III. SUMMARY OF PETITIONER'S REFERENCES

#### A. Black (EX1005)

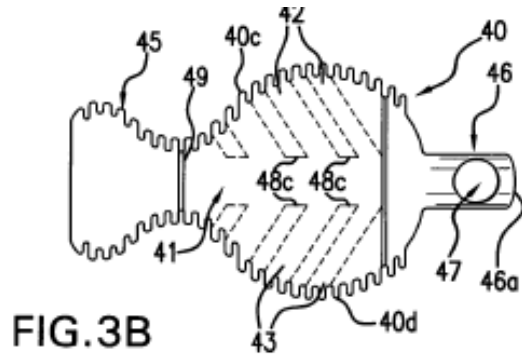
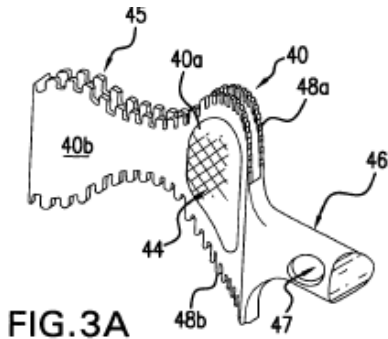
Black's corresponding published application, U.S. Pat. Pub. No. 2009/0274991 (EX2001)<sup>1</sup> was used by the Examiner for rejections in at least five different Office Actions during prosecution of the '969 Patent. EX1002, 245, 346-49; EX1020, 15-18, 123-27, 169-170. The Examiner acknowledged numerous times that Black does not disclose the claimed "bridge structure," which was the subject matter of dependent claims during much the prosecution before being added to the independent claims. EX1002, 247, 349-50; EX1020, 18, 125-127, 170-72.

Black is directed to an intraoral device with a tongue shield aspirator, a bite member, a bite grip, and an evacuation tube. EX1005, Abstract; EX2016, ¶56. Black discloses several embodiments for the tongue shield aspirator. In one embodiment, Black discloses a tongue shield aspirator 40 including "a first (posterior) layer 48a and a second (anterior) layer 48b which are connected to, but spaced apart from, one another by transverse walls 48c." EX1005, 5:55-60; EX2016, ¶57. The transverse walls 48c (shown in dashed lines) connecting the first layer 48a and the second layer 48b within the interior space of the tongue shield

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<sup>1</sup> There is no material difference between the Black's publication (EX2001) and Black's granted patent (EX1005).

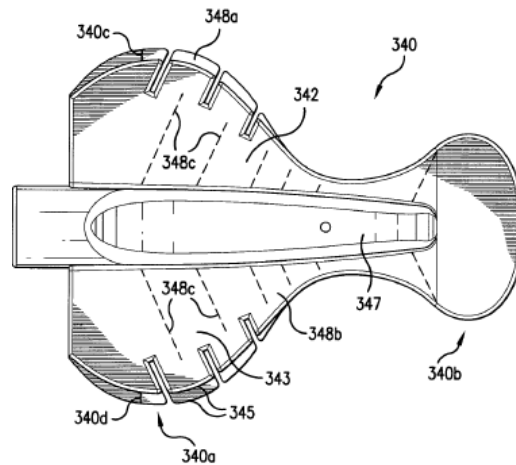
aspirator 40 are angled relative to the longitudinal axis of the tongue shield aspirator 40 as shown below in FIG. 3B.



EX1005, FIGS. 3A-3B

“[E]ach set of two consecutive walls 48c that are disposed above the longitudinal lumen 41 forms an upper channel 42” while “[e]ach set of two consecutive walls 48c that are disposed below the longitudinal hollow lumen 41 forms a lower channel 42.” EX1005, 5:27-36; EX2016, ¶58.

In another embodiment, Black discloses a tongue shield aspirator 340 including “a first (posterior) layer 348a and a second (anterior) layer 348b which *are connected to*, but spaced apart from, one another by transverse walls 348c (shown in phantom in FIG. 23A).” EX1005, 14:25-30; EX2016, ¶59. As in the prior embodiment, the transverse walls 348c are angled relative to the longitudinal axis of the tongue shield aspirator 340 as shown below in FIG. 23A.



EX1005, FIG. 23A

And like the prior embodiment, each pair of two consecutive walls 348c form the upper channels 342 and the lower channels 343. EX1005, 14:33-37; EX2016, ¶60.

Although Black does not illustrate a side view of the tongue shield aspirator 40 from FIGS. 3A-3B, Black does illustrate a side view of the tongue shield aspirator 340 from FIGS. 23A in FIG. 23C, which shows the transverse walls 348c connecting the first layer 348a and the second layer 348b, as well as and the channels 342 between adjacent transverse walls 348c. EX2016, ¶61.

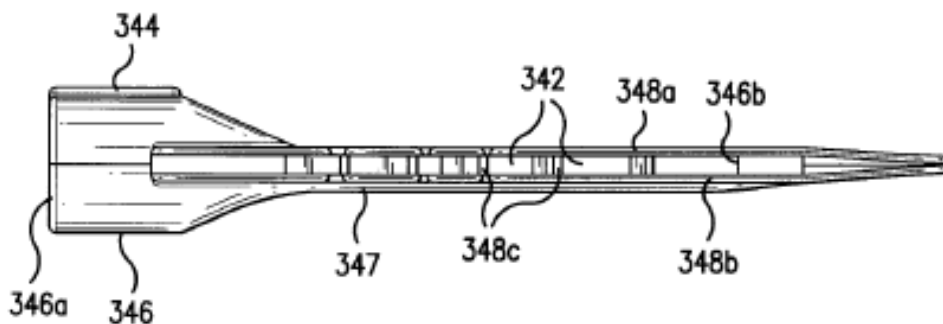


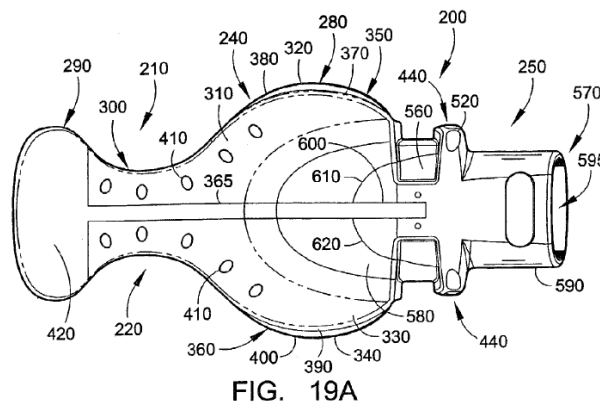
FIG. 23C

EX1005, FIG. 23C

**B. Hirsch (EX1012)**

Hirsch is directed to “dental appliances for illuminating and/or vacuum suction of the mouth of a dental patient for examination and/or operative purposes.” EX1012, ¶[0002]; EX2016, ¶63. Hirsch and its related U.S. Patent Publication No. 2006/0063129 to Hirsch<sup>2</sup> (EX2005) were used to reject the claims of the ‘969 Patent in at least four different Office Actions. EX1002, 428-30, 444; EX1020, 221-24, 287-89, 306, 322-29, 479; EX1021, 120-24; EX2016, ¶62.

Between Hirsch’s two flaps 310, 320, there is a central spine 365 that “may serve as a light pipe and a separator for an upper internal evacuation channel and a lower internal evacuation channel.” EX1012, ¶[0078]; EX2016, ¶64.



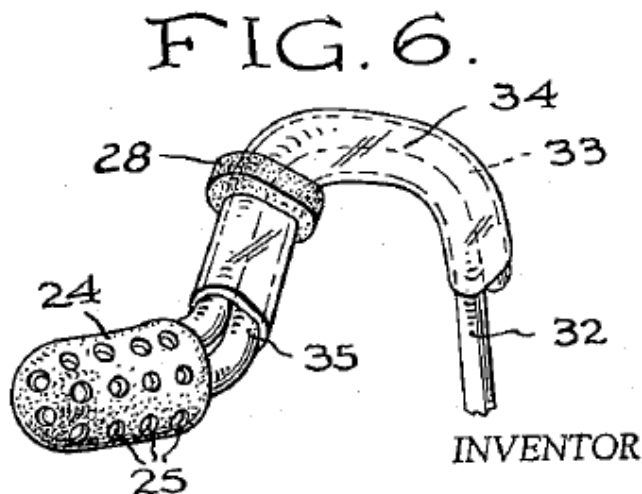
EX1012, FIG. 19A

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<sup>2</sup> Hirsch ‘129 (EX2005) is a CIP of Hirsch (Ex. 1012). For purposes of this IPR, there are no material differences between Hirsch and Hirsch ‘129. *Compare* EX1012, FIGS. 1-20 *with* EX2005, FIGS. 1-20.

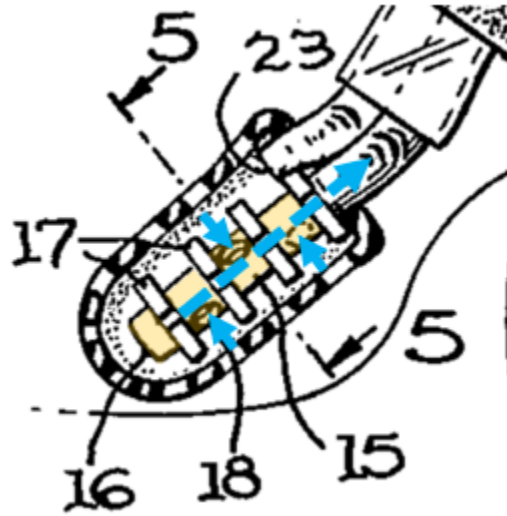
**C. Baughan (EX1007)**

Baughan was considered during prosecution of the '969 Patent and used in a rejection during an Examiner Interview. EX1020, 424. Baughan is directed to a different type of dental appliance, a dental saliva ejector with "suction relief means." EX1007, 1:6-7; EX2016, ¶65. Baughan's dental saliva ejector is designed so that it "cannot traumatize or damage the mouth tissue by sucking the tissue into the suction orifices during the operation of the device for removing saliva from the mouth." EX1007, 1:6-20; EX2016, ¶66.



EX1007, FIG. 6

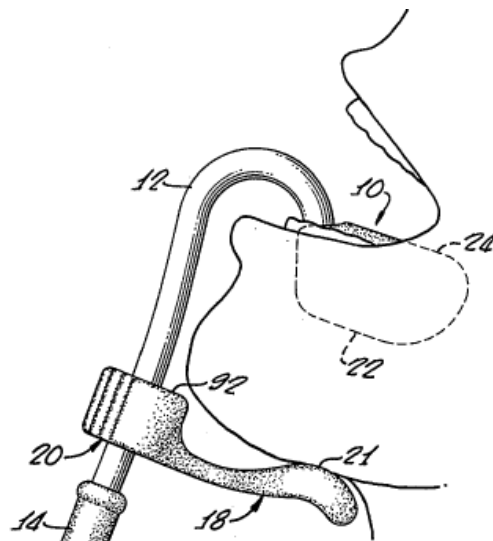
During operation, suction is applied through orifices 18 in the terminal tube portion 15, which is surrounded by a series of circular discs 17 which prevent the outer sleeve 24 from blocking the orifices 18. EX1007, 3:36-48; EX2016, ¶67.



EX1007, FIG. 3 (excerpted and annotated)

**D. Johnson (EX1008)**

Johnson was considered during prosecution of the '969 Patent (EX1002, 190) and, like Baughan, is directed to a “saliva ejector capable of acting as a tongue guard” and “a chin holder . . . adapted for use with dental appliances, such as saliva ejectors.” EX1008, 1:6-11; EX2016, ¶68.

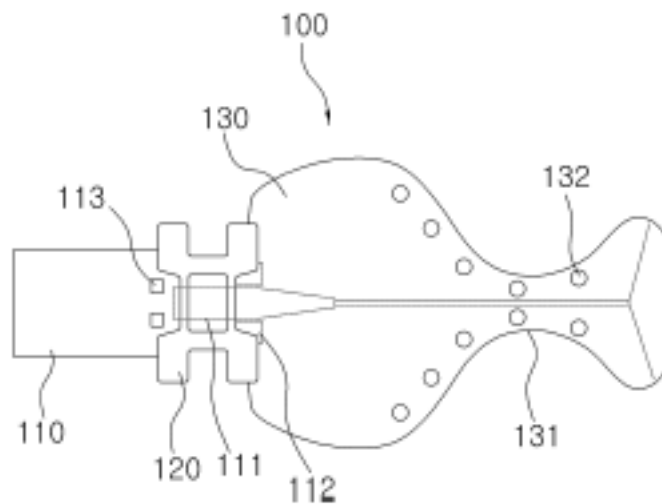


EX1008, FIG. 1

**E. Park (EX1006)**

Park is a Korean patent publication and is directed to “a detachable oral illuminating device with a mouth prop that maintains the patient’s mouth in an open state, suppresses the movement of the tongue, allows for illumination and suction of foreign substance sin the oral cavity, and enables the sterilization of only the mouth prop.” EX1006, ¶[0010]; EX2016, ¶69.

**Fig. 3**



EX1006, FIG. 3

According to Petitioner, Park has “the same basic structure of conventional isolation mouthpieces,” including Black and Hirsch. Petition, 20-21; EX1003, ¶27. Petitioner admits that Park and Hirsch “perform the same function and have very similar designs (Hirsch simply lacks sidewalls).” Petition, 74. Although the internal structures are relevant to this Petition, Petitioner admits that “Park is silent regarding whether any structures are formed inside the interior chamber of the main body.”

Petition, 58. Petitioner's expert goes further, admitting that "Park fails to expressly describe or illustrate whether the mouth prop 100 includes any internal features that assist with suction or preventing collapse under suction." EX1003, ¶131.

Considering that Petitioner has admitted (i) Park has "the same basic structure of conventional isolation mouthpieces" such as Black and Hirsch and performs the same function (Petition, 20-21, 74) and (ii) "Park fails to expressly describe or illustrate whether the mouth prop 100 includes any internal features that assist with suction or preventing collapse under suction" (EX1003, ¶131), it is clear that Park is cumulative of the references that were already considered by the Office. In fact, Petitioner's analyses of Black (Ground 1) and Park (Ground 2) relative to claim 19 confirms the cumulative nature of Park. According to Petitioner, Black teaches *more* of the claimed structures of independent claim 19 than Park because, in Ground 1, Petitioner relies on Black for teaching *all* elements of claim 19, while Petitioner is forced to combine Baughan and Johnson with Park in Ground 2 to allegedly find the features related to the internal bridge structure. In short, Petitioner has confirmed that Park is cumulative.

#### **IV. LEVEL OF SKILL IN THE ART**

Petitioner proposes the following definition for a POSITA in relation to the '969 Patent:

a PHOSITA, at the time the application corresponding to the ‘969 Patent was filed, would have been a person with at least a B.S. degree in mechanical engineering or a related field with at least two years’ experience designing medical devices. Less work experience may be compensated by a higher level of education, such as a master’s degree, and vice versa.

Petition, 28-29. For purposes of this Preliminary Response, Patent Owner adopts Petitioner’s proposed level of skill in the art.

**V. CLAIM CONSTRUCTION**

**A. The Board Should Construe the “Bridge Structure” Limitation (Claims 1-19)**

Patent Owner submits that the Board should construe the following phrases relating to the “bridge structure” in each of the independent claims. Patent Owner’s construction is consistent with the specification, with the Office’s view of the bridge structure during the 9-year prosecution of the ‘969 Patent and the Parent ‘232 Patent, and with Applicant’s arguments to the Office. EX2016, ¶¶71-107. Adopting Patent Owner’s construction for this claim phrase is dispositive for Grounds 1-5.

<b>Phrase</b>	<b>Patent Owner’s Construction</b>
the protrusions of the bridge structure protrude from the interior surface of the second wall toward the first wall in a wave shape comprising one or more	the protrusions of the bridge structure protrude from the interior surface of the second wall toward the first wall in an arrangement forming a pattern of curved surfaces between the one or

<p>crests and one or more troughs (<b>claim 19</b>)</p>	<p>more crests and the one or more troughs</p>
<p>the plurality of protrusions of the bridge structure protrude from the interior surface of the second wall in a wave shape comprising one or more crests and one or more troughs (<b>claims 1, 16</b>)</p>	<p>the plurality of protrusions of the bridge structure protrude from the interior surface of the second wall in an arrangement forming a pattern of curved surfaces between the one or more crests and the one or more troughs</p>

Independent claim 19 recites that “the second wall includes a bridge structure that includes a plurality of protrusions integral with and protruding from an interior surface of the second wall within the interior space of the pocket.” EX1001, 8:30-34. Claim 19 then goes on to define the *shape* of these protrusions by specifying that “the protrusions of the bridge structure protrude from the interior surface of the second wall toward the first wall *in a wave shape comprising one or more crests and one or more troughs.*” *Id.*, 8:34-38. It is this “wave shape” limitation that Petitioner ignores in its analysis of the ‘969 Patent in Grounds 1 and 2. Independent claims 1 and 16 recite similar limitations. *Id.*, 6:27-36 (claim 1), 8:1-6 (claim 16).

Petitioner’s interpretation of this claim phrase is refuted by intrinsic evidence, including the file history of the Parent ‘232 Patent, in which the “wave shape” term was added into the claims by an Examiner’s Amendment with the Notice of Allowance (EX1015, 145-48), which reinforces that it must limit the claims (and

distinguishes them from Black). Petitioner's argument is also contrary to the file history of the '969 Patent and the teachings of the specification, which are explained in more detail below.

### **1. Petitioner's Interpretation Renders the Term "Wave-Shape" Meaningless**

While Petitioner does not propose a construction, it argues in Grounds 1-2 that *rectangular and square* "protrusions" meet the "wave shape" requirement. Petition, 43-44 (characterizing this pattern as a "square wave"), 65-66 (same). Dr. Black opines that "the claim's requirement that a bridge structure have a 'wave shape' in view of the specification merely means that you need spaced-apart projections with gaps therebetween." EX1003, ¶99. Petitioner has confirmed that, in its view, "[t]he 'wave' shape of the bridge[] structure is simply recited in the claim as having one or more alternating crests and one or more troughs," i.e., the term "wave shape" does not limit the claims. Paper 6, at 14. Similarly, in an IPR challenging related U.S. Patent No. 12,290,418 (IPR2025-01175), Petitioner asserts that *any* series of spaced-apart projections will necessarily be in a wave-shape:

This limitation requires that the bridge structure has a plurality of "wave-like" protrusions. In light of the specification, this merely means that the wave-like structure needs spaced-apart projections with gaps therebetween. EX1001, 4:55-5:7, EX1003, 197. *The resulting shape of any such bridge structure is necessarily a wave shape.* EX1003, ¶ 97.

EX2019.<sup>3</sup> In other words, under Petitioner's apparent construction, *any* plurality of protrusions protruding from a first surface towards a second surface will include the claimed "wave shape" comprising one or more crests and one or more troughs.

Petitioner's construction cannot be correct because it ignores the full claim language and strips the phrase "wave shape comprising one or more crests and one or more troughs" of any meaning. *Hockerson-Halberstadt, Inc. v. Converse Inc.*, 183 F.3d 1369, 1374 (Fed. Cir. 1999) ("Proper claim construction ... demands interpretation of the entire claim in context, not a single element in isolation"); *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so").

There will necessarily be gaps between any plurality of protrusions that extend from one surface towards another. EX2016, ¶¶75-76. But the claims of the '969 Patent require a more specific geometry: they require that the plurality of protrusions form "a wave shape comprising one or more crests and one or more troughs." EX1001, 8:34-38; EX2016, ¶77. If any "plurality of protrusions" with gaps between them meets the claim language, as Petitioner and Dr. Black argue, then the phrase "wave shape comprising one or more crests and one or more troughs" has no

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<sup>3</sup> Unless otherwise stated, all emphasis in case cites and evidence cites is added.

meaning. Such an interpretation is incorrect. *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 792 (Fed. Cir. 2021) (adopting narrower of two proposed constructions because “if the ‘radio frequency input signal’ refers to just any radio frequency signal that is an input, then the word ‘input’ makes no contribution to the claim”).

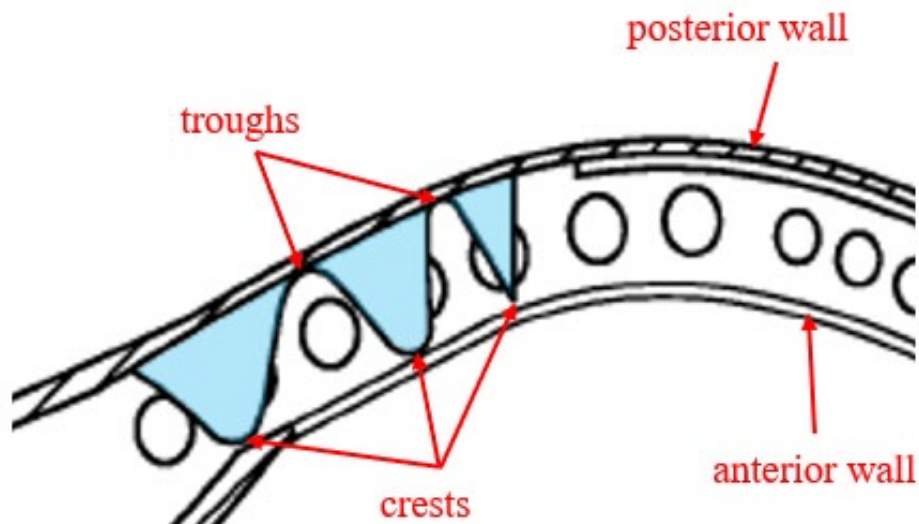
## **2. Patent Owner's Construction of the “Bridge Structure” Is Consistent with the Specification**

The specification confirms Patent Owner's construction. *Intel*, 21 F.4th at 792 (finding that consistent description of the feature in specification supported Board's construction); *Apple Inc. v. Masimo Corp.*, No. 2022-1890, 2024 WL 137336, at \*3 (Fed. Cir. Jan. 12, 2024) (“the Board's reading of the term is consistent with how the invention is described in the specification”). The specification states that the “bridge structure may protrude from the interior surface in a wave shape with crests and troughs. The crests provide a plurality of contact points with the anterior wall to keep the anterior wall separated from the posterior wall during suction.” EX1001, 2:39-48; EX2016, ¶79. The specification further explains:

bridge structure 180 may be formed as a wave-like protrusion that generally corresponds to the distance between the anterior and posterior walls extending substantially (e.g., within 1 mm) the full distance at its crest and substantially flush to the surface at its trough. ... The gaps (or troughs) between the waves of the bridge structure 180 assist in the suction-driven transfer of water and saliva to the suction connector portion 120 and ultimately, into a central suction vacuum.

EX1001, 4:52-63; EX2016, ¶80. Thus, the specification teaches the “wave-shape” of the bridge structure with its crests and troughs, as well as the functionality provided by both the crests and troughs. EX2016, ¶¶79-86.

FIG. 2E illustrates an example of a bridge structure having the “wave-shape” with its crests and troughs.



EX1001, 2:14-21, FIG. 2E (annotated); *see also id.*, FIG. 1E. As shown, there are curved surfaces at locations between the crests (the contact points with the first wall) and troughs (the minimum points near the second wall). EX2016, ¶¶81-84.<sup>4</sup>

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<sup>4</sup> By contrast, Petitioner's implicit construction is inconsistent with the specification.

There is no example of a “bridge structure” with a plurality of protrusions in a rectangular or “square” pattern. EX2016, ¶85.

The plain and ordinary meaning of “wave” is “a shape or outline having successive curves,” which is consistent with the shape of the most common “wave” – waves on a body of water. EX2016, ¶89; EX2020 (defining the noun “wave” as “a shape or outline having successive curves”). The meaning of “crests” when considering the specification of the ‘969 Patent is the points away from the second wall that serve as contact points against the first wall during suction. EX1001, 2:16-19; EX2016, ¶¶88-89; EX2021 (defining crest as “something suggesting a crest especially in being an upper prominence, edge, or limit, such as *the top of a wave*”). The meaning of “troughs” when considering the specification of the ‘969 Patent is the points nearest to the second wall that create the gaps between the crests that allow for the transfer of fluids during suction. EX1001, 2:19-21, 4:59-63 (referring “gaps (or troughs) between the waves”); EX2016, ¶¶88-89; EX2022 (defining trough as “the minimum point of a complete cycle of a periodic function”).

Putting these plain meanings together and considering all of the contextual claim language and the specification, this phrase requires that “the protrusions of the bridge structure protrude from the interior surface of the second wall toward the first wall in an arrangement forming a pattern of curved surfaces between the one or more crests and the one or more troughs.” EX2016, ¶90. It is this pattern with *curved surfaces* that differentiates the “plurality of protrusions” of the claimed bridge structure in the ‘969 Patent from any generic set of protrusions extending from one

surface towards another surface and gives meaning to the phrase “wave shape comprising one or more crests and one or more troughs” in the claims.

### **3. Patent Owner's Construction of the “Bridge Structure” is Consistent with the Prosecution History**

The prosecution history of the '969 Patent and related applications also confirm Patent Owner's construction and forecloses Petitioner's overbroad interpretation of this “wave-shape” limitation. *See Aptalis Pharmatech, Inc. v. Apotex Inc.*, 718 F. App'x 965, 971 (Fed. Cir. 2018) (“even in the absence of a clear and unmistakable disavowal, we conclude that the prosecution history can be evaluated to determine how a person of ordinary skill would understand a given claim term”).

#### **i. Prosecution History of the Parent '232 Patent**

During prosecution of U.S. Patent No. 8,911,232, which is the parent of the '969 Patent (“the Parent '232 Patent”), the Examiner rejected the pending claims in a first office action (1) as anticipated by Rhoades and (2) as obvious over Rhoades and Black. EX1015, 49-52. The dependent claims rejected as being obvious based on Rhoades and Black recited that the bridge structure has a “wave shape” similar to the challenged claims here in the '969 Patent:

9. The mouthpiece of claim 8, wherein the bridge structure protrudes from the interior surface of the posterior wall in a wave shape, and wherein the contact points are at crests of the wave shape.

10. The mouthpiece of claim 9, wherein troughs of the wave shape are configured to allow suction through the bridge structure.

*Id.*, 25. In making this rejection, the Examiner contended that Black's transverse walls 48 met the limitations of claims 9-10, ***which is Black's exact structure*** that Petitioner now relies on in Grounds 1 and 5 to allegedly find the "wave shape" limitations. *Id.*, 51-52.

In a second office action, the Examiner changed course by relying on Black for rejections of independent claim 1 and dependent claim 8, but found claims 9-10 allowable over Black because:

the prior art fail to disclose or reasonably teach of a mouthpiece holding comprising, inter alia: a bridge structure protruding from an interior surface of a posterior wall ***in a wave shape***, wherein the contact points are at ***crests of the wave shape***.

EX1015, 109-11 (emphases added); *see also* Petition, 25 (acknowledging same).

Due to analyzing Black in more detail to develop new rejections under §102, the Examiner correctly recognized Black failed to teach the "wave-shape" limitation.

In response, Applicant amended the pending claims in the Parent '232 Patent, attempting to take this allowable subject matter but, notably, did ***not*** include the "wave shape" feature in those amended claims. EX1015, 124-31. In the subsequent Notice of Allowance in the Parent '232 Patent, the Examiner entered an Examiner's Amendment adding the "wave shape" language to claim 1. *Id.*, 145-48. It is therefore

clear that the “wave shape” language was one key feature that distinguished Black during prosecution of the Parent ‘232 Patent. EX2016, ¶¶92-97. That is because Black does not disclose any “bridge structure” wherein the protrusions are arranged to form a pattern of curved surfaces between the one or more crests and the one or more troughs. Rather, as Petitioner correctly admits, Black “specifically teaches that transverse walls 48c connect to *both* the anterior and posterior layers 48a, 48b.” Pet., 26 (emphasis in original). Thus, not only are Black’s transverse walls 48 not “bridge structures” with crests that form contact points under suction, but those transverse walls 48 are flat, vertically arranged walls that are perpendicular to the anterior and posterior layers 48a, 48b and do not form the “wave-shape” in the claims.

## ii. Prosecution History of the ‘969 Patent

The prosecution of the ‘969 Patent further confirms this understanding of the “wave shape” language and highlights how other claim language for the bridge structure, e.g., the bridge structure being “unattached” to the first wall, is equally not taught by Black. After receiving the allowance in the Parent ‘232 Patent, the Applicant amended the corresponding “bridge structure” claims during prosecution of the ‘969 Patent as follows:

9. (currently amended) The dental mouthpiece of claim [[8]] 1, further comprising a bridge structure protruding from an interior surface of the posterior wall and unattached to the anterior wall, the protruding bridge structure comprising a plurality of protrusions collectively

providing spaced contact points that keep the anterior wall separated from the posterior wall during suction.

10. (currently amended) The mouthpiece of claim 9, wherein the provided suction further draws fluids through spaces between the ~~contact points~~ protrusions of the bridge structure towards the vacuum source.

EX1002, 77-78.

Thereafter, the Examiner found no less than five times that Black does not disclose the claimed “bridge structure” as set forth in dependent claims 9-10:

- After an Office Action dated November 6, 2015 (EX1002, 184) applying U.S. Patent No 4,802,851 to Rhodes as an anticipatory reference to all claims and Applicant's subsequent response dated January 29, 2016 (EX1002, 227-28), the Examiner issued a response Final Office Action dated Jun. 6, 2016 in which the Examiner found that “Black et al. discloses the invention substantially as claimed *except for a bridge structure* [in claims 9-10]” and the Examiner instead applied Riddle to reject claims 9-10. EX1002, 247.
- In a Non-Final Office Action dated November 7, 2016, the Examiner found that “Black et al in view of McKelvey discloses the invention substantially as claimed, *except the bridge structure* [in claims 9-10]” and the Examiner again applied Riddle instead. EX1002, 247.” EX1002, 349-50;
- After dependent claims 9-10 were amended to depend from independent claim 21, in the Final Office Action dated January 16, 2018, the Examiner argued

“Maycher/Black discloses the invention substantially as claimed except for a bridge structure [in claims 9-10]” and the Examiner again applied Riddle instead to reject dependent claims 9-10. EX1020, 18;

- In a Non-Final Office Action dated October 5, 2018, the Examiner found that Black does not disclose the “bridge structure [in claims 9-10]” and the Examiner again applied Riddle to reject dependent claims 9-10. EX1020, 127; and
- In a Final Office Action dated July 15, 2019, the Examiner again found that Maycher and Black do not disclose the “bridge structure [in claims 9-10]” and the Examiner again applied Riddle. EX1020, 172.

Black was fully considered by the Examiner, who repeatedly confirmed that Black did not disclose the claimed bridge structure of pending dependent claims 9-10. EX2016, ¶¶98-103.

On January 21, 2021, the Applicant added new independent claim 23 (now claim 19 in the '969 Patent), which, like the Parent '232 Patent, called for “the protrusions of the bridge structure protrude from the interior surface of the second wall toward the first wall *in a wave shape comprising one or more crests and one or more troughs.*” EX1020, 329; EX2016, ¶¶104-05. Despite the Examiner's awareness of Black and use of Black in numerous prior rejections, the Examiner determined claim 23 was allowable over the prior art, including Black, and issued a

Notice of Allowance. EX1021, 296-301. The Examiner's allowance of claim 23 (now claim 19 in the '969 Patent) is consistent with his prior determinations in the Parent '232 Patent that Black does not disclose the claimed "bridge structure" because Black lacks the claimed "wave shape comprising one or more crests and one or more troughs." EX1015, 109-11.

Petitioner would have the Board interpret the claims to read on Black despite the Office repeatedly finding that Black fails to teach the claimed "bridge structure." Petitioner's interpretation of these claim terms is far beyond "the broadest reasonable construction" standard that the Office adopts when examining claims and the plain and ordinary meaning. As a result, the Board should reject that interpretation and adopt Patent Owner's construction.

### **iii. Prosecution History of the Related '686 Patent**

Petitioner has suggested that Patent Owner's construction is inconsistent with its prior positions before the Office. Paper 7 at 17. That is incorrect. During prosecution of related Patent No. 11,744,686, the Examiner rejected the claims in that application as allegedly anticipated by Black. EX2026, 309-10. The Examiner found that Black discloses a "bridge structure 448c (shown as dashed lines 44c in Fig. 24A) ... wherein the protrusions of the bridge structure 448c protrude in a wave shape comprising one or more crests and one or more troughs (Figs. 24A and 26A)." *Id.*, 310. In response, the Applicant explained that "Black cannot teach 'wherein the

bridge structure is not attached [to] the first wall’ as claimed” and that “the walls 448c of Black are rectangular columns and do not ‘protrude in a wave shape comprising one or more crests and one or more troughs’ that protrude from ‘an interior surface of the second wall’ as claimed.” *Id.*, 369-70. Thus, Patent Owner has been consistent in its interpretation of the “wave shape” requirement, including the fact that Black’s rectangular columns do not have a wave shape.

**B. The Parties’ District Court Constructions**

In the Parallel Litigation, the parties exchanged proposed claim constructions for claim 19 the ‘969 Patent (the only asserted claim) just two days before this Preliminary Response. Patent Owner proposed the same construction above for the “bridge structure” limitation and for “crests” and “troughs.” EX2024; EX2025. The parties’ claim construction proposals are set forth below:

Term/Phrase	Patent Owner’s Proposal	Petitioner’s Proposal
“crests”	points away from the second wall that serve as contact points against the first wall during suction	the full extending distance of a projection of the internal bridge structure
“troughs”	points nearest to the second wall that create the gaps between the crests that allow for the transfer of fluids during suction	a location of the internal bridge structure substantially flush to the surface of the second wall within the interior space
“main body portion”	Plain and ordinary meaning	the portion of the mouthpiece between, but not including, the

		cheek retractor portion and the suction connector and mouth prop, if present
“pocket”	Plain and ordinary meaning	an enclosure without subdivisions that spans between the anterior wall, the posterior wall, an inferior sidewall and/or a superior sidewall
“an interior space”	Plain and ordinary meaning	an open space defined by the pocket
“a second wall having a shape that corresponds to the shape of the first wall, the shape of the second wall defined by one or more corresponding edges along one or more corresponding sides”	Plain and ordinary meaning	a second wall having a substantially identical shape to the shape of the first wall, such that the edges of the second wall are aligned with the edges of the first wall
“bridge structure”	Plain and ordinary meaning, except as construed as above	an internal structure attached to the second wall that prevents the collapse of the first and second wall during suction
“an interior surface of the second wall”	Plain and ordinary meaning	a surface of the second wall facing the first wall between, but not including, the edges of the second wall
“a connecting wall that connects one or more edges of the first wall to the one	Plain and ordinary meaning	a sidewall that connects either the inferior edge of the first wall to the inferior edge of the second wall or the superior

<p>or more corresponding edges of the second wall across a span between the first wall and the second wall”</p>		<p>edge of the first wall to the superior edge of the second wall</p>
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Patent Owner identifies these constructions so that the record is complete but submits that the Board only needs to construe the “bridge structure” limitation (which also includes the “crest” and “trough” terms) to find that Petitioner did not meet its burden. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

**C. The Petition Does Not Comply with the Board’s Claim Construction Rules**

The Board’s rules require that the petition sets forth “[h]ow the challenged claim is to be construed.” 37 C.F.R. § 42.104(b)(3). The Petition does not expressly propose any claim constructions and states that “[u]nless otherwise addressed here, the terms of the ‘969 Patent are to be given their plain and ordinary meaning.” Petition, 29-30; EX1003, ¶52 (“I believe that all terms . . . can be given their plain and ordinary meaning”). Two paragraphs later, Petitioner acknowledges that “[t]he parties are likely to dispute the scope of several terms, such as ‘end,’ ‘edge,’ ‘side,’ ‘corresponding shape,’ and ‘interior surface’” yet does not identify any constructions for these terms. Petition, 29-30.

Petitioner represents that “Ground 1 addresses *some of* Patent Owner’s broad construction[s], and Ground 2 addresses either Patent Owner’s or Petitioner’s construction of sidewall/connecting wall, ‘edge,’ ‘side,’ ‘end,’ ‘interior surface,’ and ‘corresponding shape.’” *Id.*, 30. But again, Petitioner does not identify what these “constructions” are, or how they affect its analysis in Grounds 1 and 2. Petitioner’s expert fares no better and merely states that “[t]o the extent that the parties have disputes as to claim interpretation, they are irrelevant to the validity of the ‘969 Patent.” EX1003, ¶53; *see also id.*, ¶55 (“claim construction is not an issue the Board must resolve to find invalidity”). But the dispute is relevant insofar as Petitioner prevails with its construction in district court because, by Petitioner’s admission, Ground 1 would fail under its construction(s) (whatever they are).

The Board’s rules are clear that the Petition must explain “[h]ow the challenged claim is to be construed.” 37 C.F.R. § 42.104(b)(3). The purpose of this rule is to ensure that both the parties and the Board can assess if the prior art meets the requirements of the challenged claims. But Petitioner does not explain what constructions it applied in Grounds 1 and 2. Petitioner’s recent claim construction disclosures in the Parallel Litigation exacerbate the lack of clarity. *See* EX2024. Because the Petition does not say which claim constructions were applied, it is unclear whether these are the claim constructions Petitioner applied in Ground 2, or whether the Petition applied different constructions.

As an example, it appears Petitioner is taking at least one inconsistent position between the Parallel Litigation and this IPR. Here, Petitioner's expert says that "the term 'pocket' means a fully-enclosed, four-sided mouthpiece." EX1003, ¶86. In the Parallel Litigation, Petitioner says that this term requires "an enclosure *without subdivisions* that spans between the anterior wall, the posterior wall, an inferior sidewall and/or a superior sidewall" and excludes mouthpieces with a central spine. EX2024, 3. Yet, as discussed below, Petitioner argues in Ground 2 (which is supposedly based on Petitioner's constructions) that Park's mouthpiece with a central spine has the claimed "pocket," even though that Park's spine would create an enclosure *with* "subdivisions." EX1003, ¶134; Petition, 59; *infra*, §VI.B.2.a. This inconsistency highlights how Petitioner's failure to identify "[h]ow the challenged claim is to be construed" makes it unclear what constructions Petitioner used. 37 C.F.R. § 42.104(b)(3).

Petitioner's reliance on Patent Owner's "implied" claim constructions Ground 1 is also problematic because a petitioner may not adopt a claim construction it expressly disagrees with. *Hologic, Inc. v. Enzo Life Sciences, Inc.*, IPR2018-00019, Paper 21 at 6-7 (PTAB Nov. 28, 2018) (holding that a "Petitioner does not satisfy Rule 42.104(b)(3) when ... it expressly disagree[s] with its proffered constructions") (citations omitted); *CareFusion Corp. v. Baxter Int'l, Inc.*, IPR2016-01456, Paper 9 at 6-7 (PTAB Feb. 6, 2017) (finding that "Petitioner has failed to prove a sufficient

statement of how the challenged claims are to be construed” because “it relies on constructions advanced by Patent Owner in the related litigation” but “also states that it *does not agree that those constructions are in fact correct*”) (emphasis in original).

Petitioner and Dr. Black disagree with the “implied” constructions they use in Ground 1. For example, Dr. Black opines that “while *I do not agree* that significantly different sized walls can be ‘corresponding’ under the claim language ... I nevertheless apply Patent Owner’s implied construction here.” EX1003, ¶54. As another example, Dr. Black offers a conclusory assertion that “the term ‘pocket’ means a fully-enclosed, four-sided mouthpiece” and that “[d]espite this understanding, it is clear that Patent Owner advances a much broader interpretation of ‘pocket’” that he disagrees with. *Id.*, ¶86. For the term “connecting wall” in claim 19, Petitioner claims that “almost all prior art dental isolation mouthpieces disclose a connecting wall” under what it perceives to be Patent Owner’s infringement theory. Petition, 16. Yet Petitioner and Dr. Black say they disagree with that reading of “connecting wall.” While a petitioner may adopt a claim construction for an IPR, it cannot do so while saying it disagrees with it. *Hologic*, IPR2018-00019, Paper 21 at 6-7.

In sum, because Petitioner does not explain how “the challenged claim is to be construed,” the Board cannot reasonably assess the grounds in the Petition and should deny institution. 37 C.F.R. § 42.104(b)(3).

## **VI. PETITIONER FAILED TO MEET ITS BURDEN**

The Board should deny institution because Petitioner has not met its burden of showing a reasonable likelihood that any claim of the '969 Patent is unpatentable for any of the grounds in the Petition. Grounds 1 and 5 can be grouped together: Ground 1 relies solely on Black, while Ground 5 replicates Ground 1 while adding Hirsch for the “perforations” claim limitation. Ground 2 is a §103 ground based on Park, Baughan, and Johnson, and Grounds 3-4 only address dependent claims. The Board should deny institution at least because Petitioner failed to meet its burden to show that the prior art discloses the claimed bridge structure with protrusions “in a wave shape comprising one or more crests and one or more troughs” as required in the independent claims.

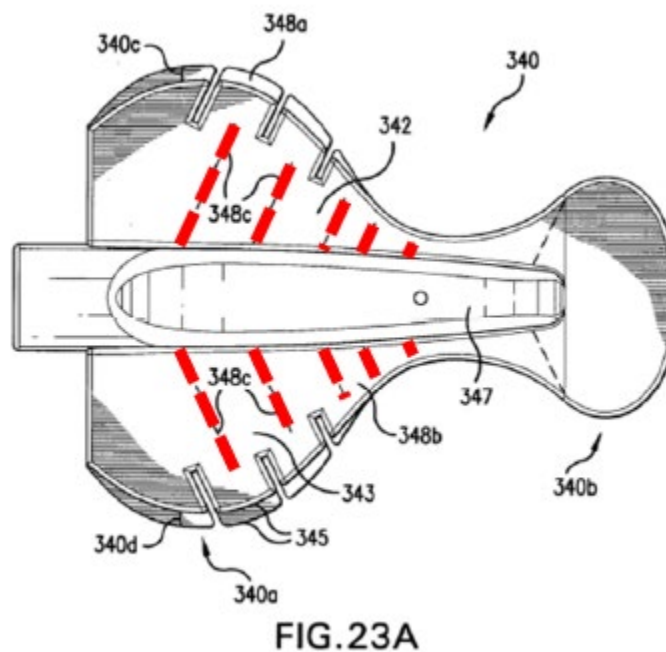
### **A. Grounds 1 and 5: Purported Anticipation by Black and Obviousness over Black (Claim 19)**

In Ground 1, Petitioner argues that Black anticipates or renders obvious independent claim 19. Petition, 36. While this is really two grounds (anticipation and obviousness), the analysis below is the same because Petitioner's reliance on Black

for the “bridge structure” in limitation 19(e) is the same and equally faulty under both grounds.

**1. Black Does Not Disclose a “Bridge Structure” with a “Wave Shape” Having “Crests” and “Troughs”**

For limitation 19(e), which includes the claimed “bridge structure” discussed above, Petitioner relies on two embodiments from Black. Petition, 42-45. Petitioner first relies on the embodiment in FIGS. 23A-C and points to the transverse walls 348a that are integral with the posterior flap 348a and the anterior flap 348b:



EX1005, FIG. 23A (annotated)

In an attempt to address the “wave shape” requirement in claim 19, Petitioner argues that Black’s “transverse walls 348c form crests in a wave shape and the channels 342 form troughs in a wave shape” and argues the annotation figure below

“illustrates the *square wave shape* formed by the presence of [sic] absence of the transverse walls.” Petition, 43-44.

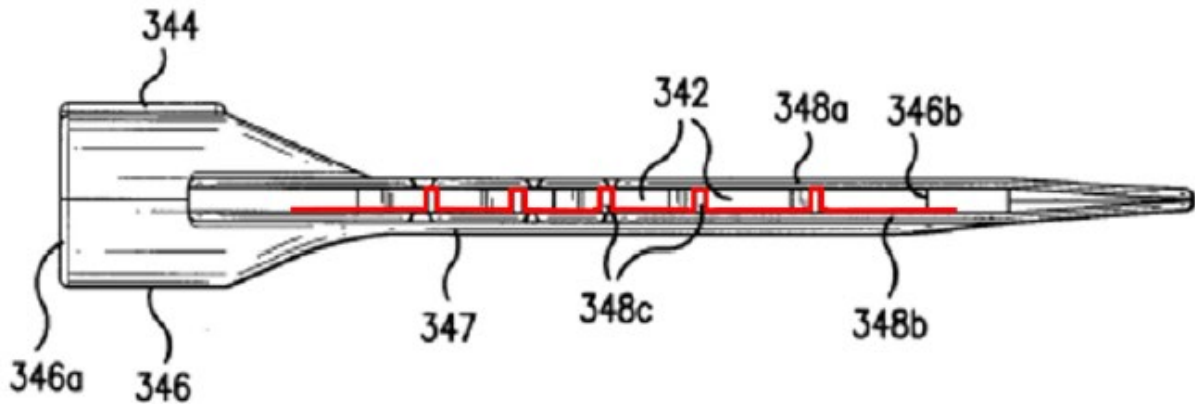


FIG. 23C

Petition, 44 (annotating EX1005, FIG. 23C)

Petitioner's annotated version of FIG. 23C is misleading as the red lines outlining this alleged “square wave” do not represent “protrusions.” EX2016, ¶¶112-13. Black describes them as transverse *walls* 388c that are integral with both the posterior and anterior walls 348a and 348b. EX1005, 14:25-30; EX2016, ¶114. Indeed, the '969 Patent itself distinguishes between a “wall” and a “protrusion.” EX1001, 3:44-47 (describing posterior and anterior walls), 4:53-55 (describing the “bridge structure” as a “wave-like protrusion . . . between the anterior and posterior walls); EX2016, ¶114. For example, claim 19 separate recites the “first wall,” the “second wall,” and the “connecting wall,” then separately refers to the “protrusions” that protrude from the interior surface of the second wall towards the first wall.

EX1001, 8:23 (“first wall”), 8:27 (“second wall”), 8:32 (“plurality of protrusions integral with and protruding from an interior surface of the second wall”). It is well-settled that “[d]ifferent claim terms are presumed to have different meanings.” *Bd. of Regents of the Univ. of Tex. Sys. v. BENQ Am. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008). Because Black fails to teach any “protrusion” or “crest” (i.e., a contact point rather than an attachment point), Petitioner has not met its burden.

Furthermore, contrary to Petitioner's suggestion, Black's alleged “square wave” shape is not the claimed “bridge structure” under the proper claim construction – *i.e.*, the protrusions of the bridge structure are arranged to form a pattern of curved surfaces between the one or more crests and the one or more troughs. EX2016, ¶¶115-16; *supra*, §V.A. Each of Black's transverse walls 348c is rectangular rather than “wave shaped,” and there are no “crests” that serve as contact points to the first wall during suction because Black's transverse walls 348c are integral with both flaps 348a and 348b. EX2016, ¶116; *supra*, §V.A. This is consistent with the Office's repeated findings regarding Black during the lengthy prosecution history of the '969 Patent and the Parent '232 Patent. *Supra*, §V.A.3.

The Petition also cites FIG. 3B of Black and argues “[e]lements 42 and 43 illustrate the channels, or troughs, and element 48c illustrates the crests.” Petition, 44.

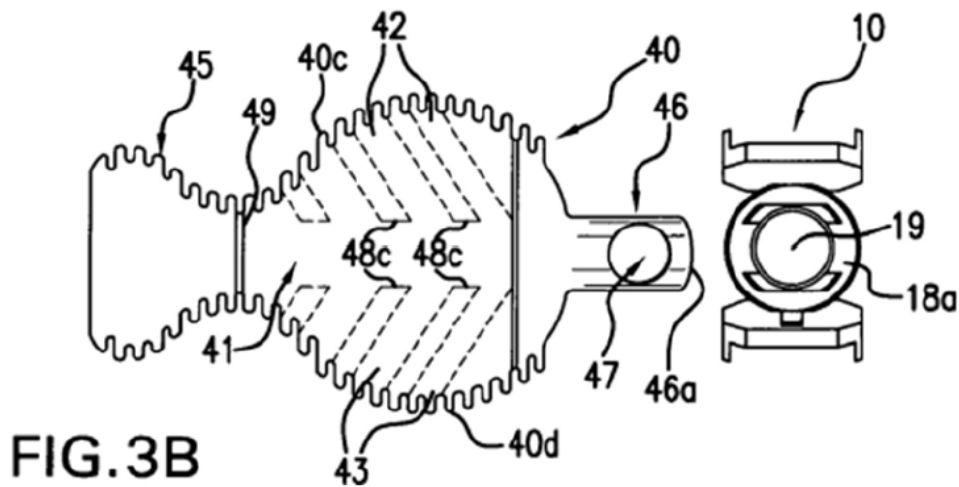
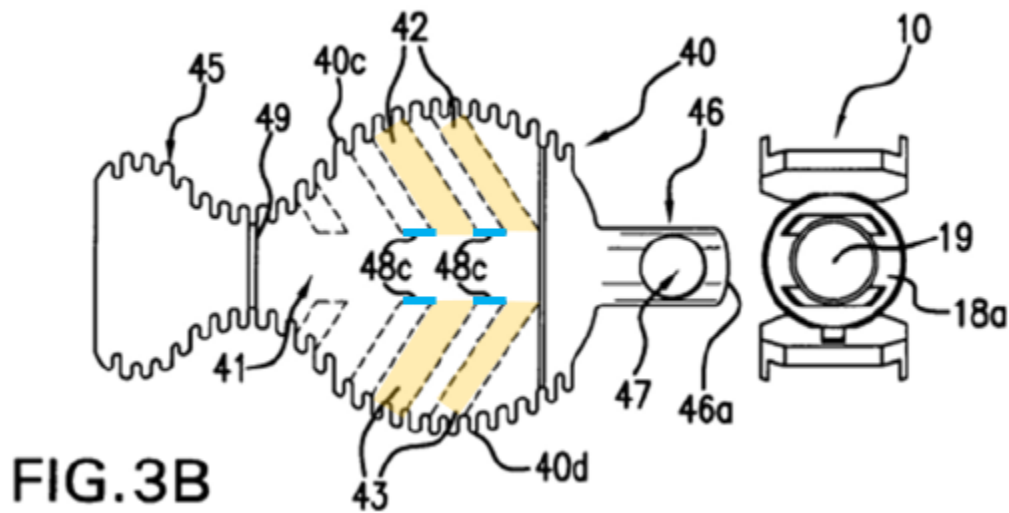


FIG. 3B

EX1005, FIG. 3B

Petitioner is attempting to confuse the issues by showing a different embodiment in Black where *the flaps* (not the transverse walls) have a wavy exterior edge. To be clear, what Petitioner is pointing to as the claimed “bridge structure” are elements 42 and 43 (alleged channels) and transverse walls 48c (alleged crests), which do not form the claimed “bridge structure” for the same reasons that the transverse walls 348c do not in the prior embodiment. Petition, 44-45; EX2016, ¶¶117-18.



EX1005, FIG. 3B (annotated)

Petitioner's reliance on FIG. 3B is also unavailing because, as Petitioner admits, "FIG. 3B is directed to a *different embodiment* than the embodiment shown in FIGs. 23A-C." Petition, 44 (quoting EX1005, 11:55-60, 14:2-5); EX2016, ¶118. "A reference can anticipate a claim even if it does not expressly spell out all the limitations arranged or combined as in the claim, if a person of skill in the art, reading the reference, would at once envisage the claimed arrangement or combination." *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381 (Fed. Cir. 2015) (internal quotation marks omitted). When a petitioner relies on different embodiments in a single reference for anticipation, it must "identify guidance in the disclosure to link them together." *Otonomy, Inc. v. Auris Med., AG*, 743 F. App'x 430, 439 (Fed. Cir. 2018). Petitioner offers no evidence that a POSITA

would at once envisage a combination of both embodiments; it only argues that FIG. 3B “informs” FIG. 23C. Petition, 44-45; EX1003, ¶100.

The Board has denied institution in similar cases where a petitioner relied on multiple embodiments for anticipation without sufficiently linking them together. *See, e.g., Intelligent Wellhead Sys., Inc. v. Downing Wellhead Equip., LLC*, IPR2024-00583, Paper 9 at 17-18 (PTAB Sept. 12, 2024) (denying institution because “[n]either Petitioner nor Petitioner's Declarant discuss the combinability of the embodiment described on pages 11 and 12 ... and the embodiment described on page 4”); *Ontel Prods. Corp. v. Guy A. Shaked Invs. Ltd.*, IPR2020-01703, Paper 12 at 13-14 (PTAB Apr. 13, 2021) (denying institution because “Petitioner's analysis of claim 1 relies on features found in different embodiments of Choi without ever explaining how the reference discloses the combinability of those features or why an ordinarily skilled artisan would immediately envisage combining those features in the claimed manner”).

## **2. Petitioner Does Not Argue Obviousness for the “Bridge Structure”**

In Ground 1, Petitioner argues obviousness in the alternative for limitations 19(d), 19(e), 19(f), and 19(h). Petition, 40-50. For limitation 19(d), Petitioner argues “it would have been obvious to resize and shape the posterior layer 348a to be identical to the anterior layer 348b in view of Black's other embodiments.” *Id.*, 42. For limitation 19(e), Petitioner argues that “combining features between the

embodiments within the same reference ‘does not require a leap of inventiveness.’”

Petition, 45. For limitation 19(f), Petitioner argues “it would have been obvious to include the connecting wall” from the FIG. 4C into Black’s other embodiments.”

Petition, 48. For limitation 19(h), includes a conclusory “catch-all” that if “any combination of embodiments is required, then the claims are obvious in view of the embodiments of Black, which are easily combinable if not already combined.”

Petition, 50. However, *none* of these alternative obviousness arguments address the “wave shape” requirement for the claimed “bridge structure.” *Id.* Thus, whether considered as an anticipation ground or an obviousness ground, Petitioner failed to meet its burden for the reasons discussed above. *Supra*, §VI.A.1.

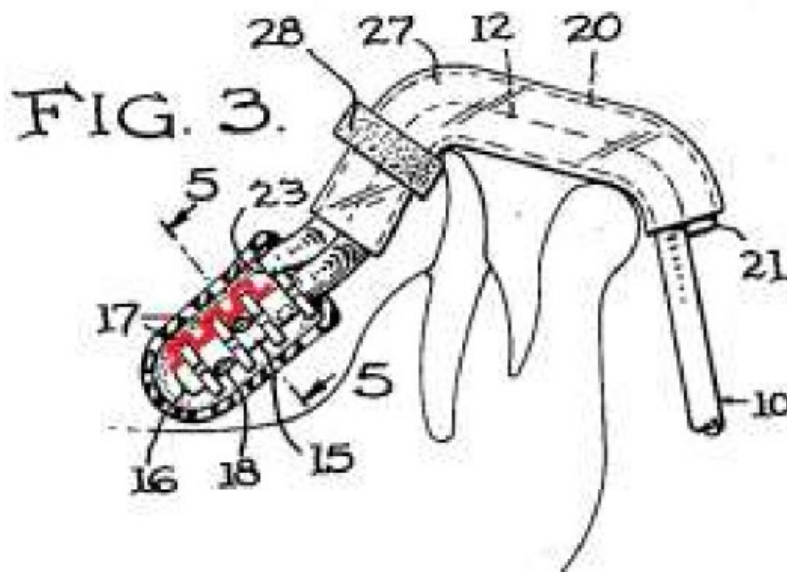
In Ground 5, Petitioner argues that independent claim 19 is obvious over Black in view of Hirsch to the extent Black does not disclose the claim perforations. Petition, 76. Petitioner does not rely on Hirsch for any other limitations, including the “bridge structure” in limitation 19(e). *Id.* Thus, the Petitioner has failed to meet its burden for Ground 5 for at least the same reasons it failed for Ground 1. EX2016, ¶¶172-73; *supra*, §VI.A.1.

**B. Ground 2: Purported Obviousness over Park in view of Baughan (Claims 1-4, 6-9, 11-12, 14, and 16-19)**

In Ground 2, Petitioner argues that claims 1-4, 6-9, 11-12, 14, and 16-19 are obvious over Park in view of Baughan. Petition, 50-72. For at least the reasons set forth below, Petitioner failed to meet its burden for this ground.

**1. Even if Combined, Park and Baughan Do Not Disclose the Claimed “Bridge Structure” as Properly Construed**

For limitation 1(h), Petitioner argues that when Park, Baughan, and Park are combined, they meet the claimed “bridge structure” requirement because “Baughan teaches that the spaced-apart discs [17] result in a *square wave shape* having crests and troughs” and that “the notches 19 in the disc also form a *square wave shape*.” Petition, 65; EX2016, ¶¶123-24. Petitioner annotates this pattern from Baughan as shown below:



Petition, 65 (annotating EX1007, FIG. 3)

As discussed above, a “square wave” is *not* a successive pattern of *curved surfaces* between the one or more crests and the one or more troughs, i.e., the claimed bridge structure as properly construed in light of the surrounding claim language, specification, and prosecution history. *Supra*, §V.B. This is consistent

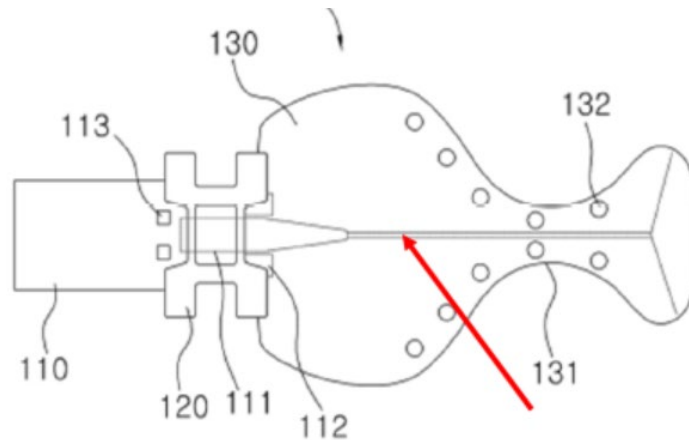
with the Examiner's repeated findings during prosecution of the '969 Patent and the Parent '232 Patent that Black—which Petitioner also characterizes as having a “square wave” shape—does not meet the claimed “bridge structure” limitation. *Supra*, §V.B.3. Thus, even if a POSITA were motivated to modify Park (which they would not, *see infra*, §VI.B.2), the proposed Park-Baughan-Johnson combination does not meet the “bridge structure” limitation in the challenged claims. EX2016, ¶¶125-29. Petitioner therefore failed to meet its burden for Ground 2.

**2. A POSITA Would Not Have Been Motivated to Modify Park with Baughan and/or Johnson**

Regardless of claim construction, Petitioner has failed to show that a POSITA would have been motivated to modify Park in view of Baughan and/or Johnson to meet the claimed “bridge structure” requirement. EX2016, ¶130. Park does not disclose, teach, or suggest any “bridge structure,” let alone a bridge structure with the shape required in the challenged claims. EX2016, ¶131; *supra*, §V.B. Indeed, Petitioner and Dr. Black admit that “Park is silent regarding whether any structures are formed inside the interior chamber of the main body.” Petition, 58; EX1003, ¶131 (admitting “Park fails to expressly describe or illustrate whether the mouth prop 100 includes any internal features that assist with suction or preventing collapse under suction”).

Petitioner and Dr. Black admit they can only speculate as to the function of certain features shown in Park. For example, Dr. Black refers to “what appears to be

a light pipe” (annotated below) but admits that “it is unclear whether this is structural or simply something to assist with lighting.” EX1003, ¶131; *see also* Petition, 60 (speculating that “the line shown in FIG. 3 may not provide any rigidity or anti-collapse features at all and may only assist in guiding light from the light guide 240”).



EX1003, ¶131 (annotating EX1005, FIG. 3)

Petitioner claims that Park’s lack of details “may be intentional as Park mentions that ‘common features,’ such as anti-collapse structures, ‘are omitted.’” *Id.*, (quoting EX1006, ¶22). To the extent that Petitioner is suggesting that Park did not mention “anti-collapse structures” because they were “common” in dental isolation mouthpieces, Petitioner provides no evidence that such a structure was “common” in prior art isolation mouthpieces. EX2016, ¶131.

Attempting to address this critical deficiency in Park with respect to the claimed “bridge structure,” Petitioner proffers only one alleged motivation to modify

Park: that “the first wall and the second wall are likely to collapse under the suction force.” Petition, 58. Specifically, Petitioner argues that “[t]his “collapsing would occur because teaches that the mouthpiece comprises a flexible material, such as silicone.” *Id.* (citing EX1006, ¶¶32, 34). As discussed below, Petitioner has not shown that a POSITA would recognize such a problem with Park and therefore would have been motivated to modify Park. Instead, Petitioner’s obviousness combination is an improper hindsight reconstruction.

**a) Park is Not “Likely to Collapse” Under Suction**

As noted above, Petitioner argues that a POSITA would modify Park to meet the claimed “bridge structure” limitation because Park’s walls are “likely to collapse under the suction force.” Petition, 58. But Petitioner has not shown that a POSITA would recognize this supposed problem in Park, or that the problem was otherwise known in the field of dental isolation mouthpieces before the ‘969 Patent. EX2016, ¶134. Quite the contrary, Petitioner’s own evidence shows that Park’s walls would *not* collapse under suction, which refutes Petitioner’s only proffered reason for modifying Park to include an alleged “bridge structure.”

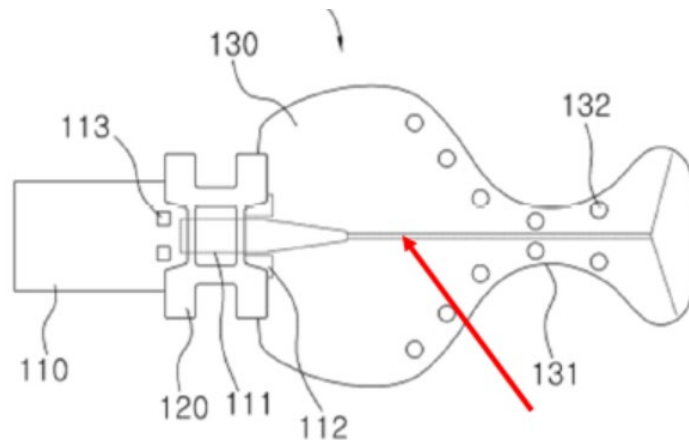
Dr. Black initially suggests that Park’s walls would collapse under suction (and therefore motivate the addition of a bridge structure) “given how thin Park’s mouth prop 100 appears.” EX1003, ¶133. But Park does not disclose any dimensions for the walls or indicate that the figures are drawn to scale that would permit Dr.

Black to reach this conclusion. EX2016, ¶135. Indeed, Petitioner admits that “Park ... is silent regarding the thickness of its various walls.” Petition, 74. Because Park’s figures “are not drawn to scale” and do not provide dimensions, Dr. Black’s argument that Park’s mouthpiece would collapse because it appears “thin” in the drawings is “unavailing.” *Nystrom v. TREX Co.*, 424 F.3d 1136, 1149 (Fed. Cir. 2005); *see also Regents of Univ. of California v. Satco Prods., Inc.*, No. 2023-1356, 2024 WL 4972639, at \*4 (Fed. Cir. Dec. 4, 2024) (vacating Board decision that relied on “relative thickness” of feature shown in figures that were not drawn to scale).

The only other reason Petitioner provides regarding why Park’s walls would supposedly collapse (and therefore motivate the addition of a bridge structure) is that they are formed from “a flexible material, such as silicone.” Petition, 58 (citing EX1006, ¶¶32, 34). But the mere fact that Park comprises “flexible” material like silicone does not mean that the walls would collapse under suction. EX2016, ¶¶136-37. Park states that its material has “a predetermined elasticity” but does not provide any values. EX1006, ¶[0032]; EX2016, ¶¶136. A POSITA would know that silicone can have varying degrees of hardness, tensile strength, and elasticity such that Park’s mouthpiece would not necessarily collapse under suction. EX2016, ¶137; EX2023. Further, Dr. Black admits that “elasticity and ‘resiliency’ are essentially synonymous concepts.” EX1003, ¶155; EX2016, ¶138.

Petitioner's own assertions and evidence further undermine its argument that "flexible material" is inherently "likely to collapse under the suction force." First, Petitioner admits that Park's "sidewalls and the insertion part 111 would help resist this collapse force" and that "the sidewall, the socket 111, or the insertion port 110" are "*rigid* structure[s]." Petition, 58. The sidewall, socket 111 and insertion port 110 are made of the same material as the rest of Park's mouthpiece, yet Petitioner characterizes them as "rigid." EX2016, ¶¶139-40; Petition, 58. On one hand, Petitioner argues that "collapsing *would occur*" because Park's mouthpiece comprises a flexible material, yet on the other hand admits that the same material prevents collapse. Petitioner cannot have it both ways.

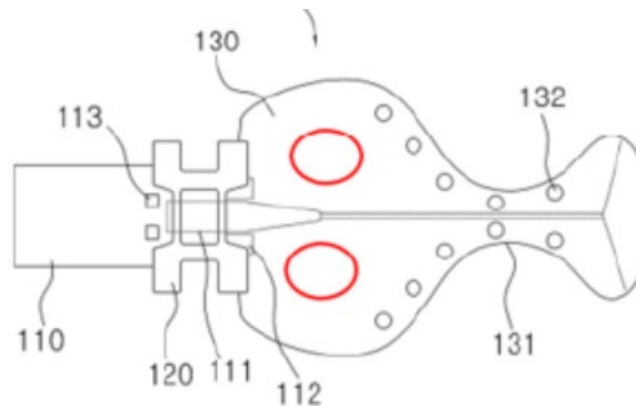
Second, while Petitioner and Dr. Black admit that Park is ambiguous, Dr. Black "assumes that there is a spine running down the symmetrical axis of the mouthpiece." EX1003, ¶134; Petition, 59.



EX1003, ¶131 (annotating EX1005, FIG. 3)

Dr. Black characterizes this spine as an “anti-collapsing structure.” *Id.*, ¶¶133, 184-85 (explaining that a “spine” would increase rigidity). The fact that this central “spine” is made of the same flexible material as the rest of the mouthpiece and yet provides rigidity further undermines Petitioner’s theory that Park’s flexible material would inherently collapse. EX2016, ¶¶141-42.

Third, Petitioner identifies the areas circled in red below as being the most likely to collapse under suction. Petition, 61; EX1003, ¶¶133-35.



Petition, 59 and EX1003, ¶133 (annotating EX1007, FIG. 3)

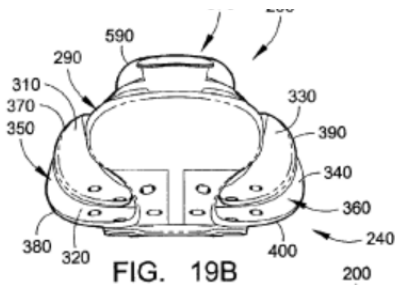
But Petitioner provides no explanation or evidence for this assertion beyond Dr. Black’s<sup>5</sup> conclusory testimony that cites no additional evidence or facts beyond those in the Petition. EX1003, ¶¶131-35. Such testimony is entitled to no weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15-17 (PTAB Aug. 24,

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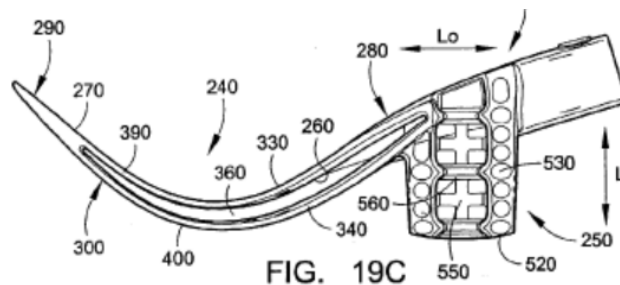
<sup>5</sup> The Board should consider the fact that Dr. Black is not a mechanical engineer in weighing his testimony on this point. *Infra*, §VI.E.

2022) (precedential) (testimony restating “the petitioner’s arguments without any additional supporting evidence or reasoning” is accorded “little weight”); 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight”).

In any event, Petitioner’s own evidence once again contradicts its characterizations of the “problem” In Park. For example, Petitioner and Dr. Black admit that Park is the same as Hirsch, with the only difference being that “Hirsch simply lacks sidewalls.” Petition, 74; EX1003, ¶185. If Petitioner were correct that Park has “weak points” that require reinforcement, then Hirsch would have the same problem given its similarity to Park. EX2016, ¶¶144-45. In fact, according to Petitioner, the problem would be even worse in Hirsch because it “lacks sidewalls” (Petition, 74), whereas Park has sidewalls that resist collapse (*id.*, 58).

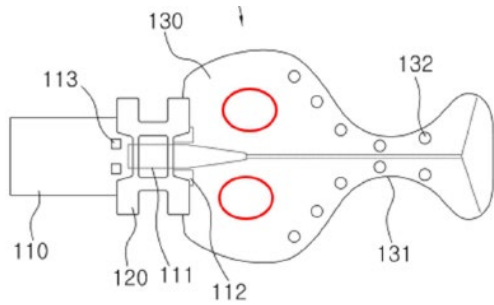


EX1012, FIG. 19B

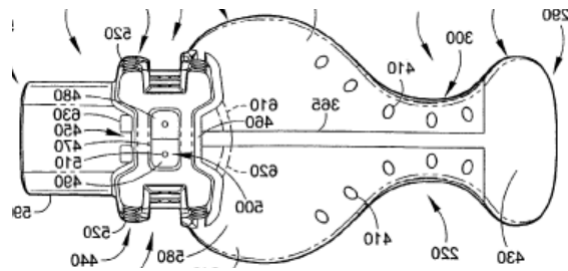


EX1012, FIG. 19C

Yet Hirsch has no reinforcing structure at the same supposed “weak points” identified by Petitioner:



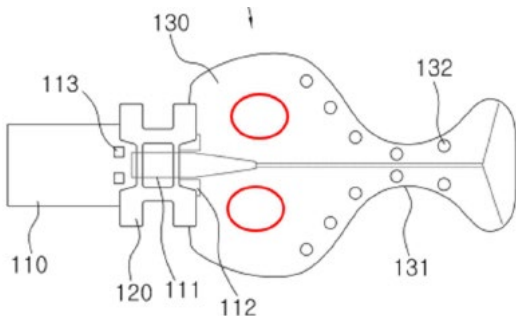
EX1003, ¶133



EX1012, FIG. 19E

EX2016, ¶¶145-46. Hirsch therefore refutes Petitioner's assertions that a POSITA would recognize a problem with Park's walls collapsing under suction.

Similarly, Dr. Black's opinions regarding Park's "problem" are contradicted by his discussion of the "Isolite" product. EX1003, ¶¶10-18. The Isolite product is similar to Park and Hirsch and lacks "sidewalls" but there are no anti-collapse structures at the supposed "weak points" in Park. EX2016, ¶¶147-48.



EX1003, ¶133



EX1003, ¶11

The fact that similar mouthpieces would have at least the same if not more reason to include "anti-collapse" structures and yet contain none confirms that a POSITA would not recognize a problem with Park's walls collapsing. EX2016, ¶149.

Petitioner's argument that a POSITA would modify Park to avoid collapse is also flawed because it is premised on Park's mouthpiece being inoperable in its current form. Petitioner argues that unless Park is modified with Baughan's "anti-collapse" features, "collapsing *would occur* because Park teaches that the mouth prop comprises a flexible material, such as silicone." Petition, 58. Petitioner goes on to explain that if Park's walls "collapse under suction, suction power would be significantly reduced or blocked entirely." Petition, 59; EX1003, ¶135.

If, as Petitioner suggests, suction is "blocked entirely" in Park, then Park would not work for its intended purpose, which includes "forming a suction line to expel foreign substances from the oral cavity" during dental procedures. EX1006, ¶[0012]; EX2016, ¶¶150-51. Park also would not work, or would at least be ineffective, if suction is "significantly reduced" due to collapsing walls. EX2016, ¶151. Indeed, Petitioner admits that its proposed modification to Park is not just an improvement but is in fact necessary "**lest the purpose of Park's mouth prop be defeated.**" Petition, 63. This reasoning is flawed because Park "is presumed to be operable." *Ex Parte Thomas Edward Shafovaloff*, No. Appeal 2022-004103, 2023 WL 5321165, at \*2 (PTAB Aug. 16, 2023) (citing *In re Sasse*, 629 F.2d 675 (CCPA 1980)). If anything, the fact that Park lacks any internal "anti-collapse" structure refutes Petitioner's proposed motivation to modify Park. Stated another way, if "anti-collapse" structure were actually necessary for Park's mouthpiece to work, as

Petitioner argues, then Park would have disclosed it. But as Petitioner admits, Park does not. EX2016, ¶151.

As the above discussion demonstrates, Petitioner's proposed Park-Baughan-Johnson combination is merely a hindsight reconstruction of the invention. The Federal Circuit has held that the use of improper hindsight is apparent where, as here, the petitioner fails "to demonstrate . . . that the problem was known in the art or that [the petitioner's] formulation of the problem was derived directly from the prior art, rather than from the challenged claims." *Purdue Pharma L.P. v. Depomed, Inc.*, 643 F. App'x 960, 966 (Fed. Cir. 2016); *see also Grain Processing Corp. v. Am. Maize-Prods. Co.*, 840 F.2d 902, 907 (Fed. Cir. 1988) ("Care must be taken to avoid hindsight reconstruction by using 'the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit'") (quoting *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1012 (Fed. Cir. 1983)).

Petitioner has not shown that the alleged problem in Park's isolation mouthpiece—walls collapsing under suction—was known in the art before the '969 Patent. Park does not disclose this problem and, if anything, suggests that there is no such problem. To the extent Petitioner argues that Baughan demonstrates that the problem with structures collapsing under suction was known, this argument fails because Baughan is directed to a dental saliva ejector rather than an isolation

mouthpiece, so it does not and cannot teach that the walls Park's mouthpiece would collapse under suction. EX1007, 1:7-8; EX2016, ¶154. To the extent Petitioner points to Black, which is not even part of Ground 2, it contains no express teaching regarding this problem. *Id.*

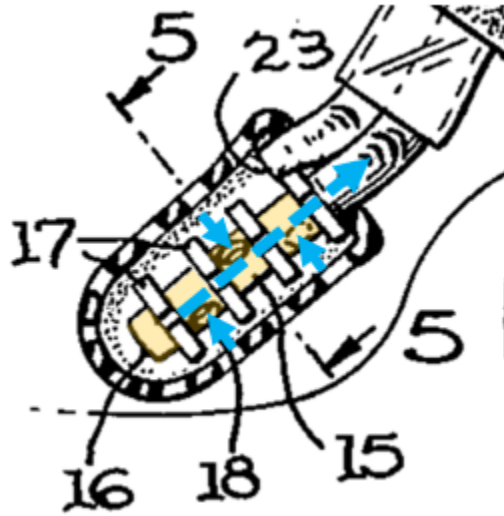
The only express teaching of the collapsing problem which forms the basis for Petitioner's obviousness combination comes from the '969 Patent itself, which teaches that the bridge structure "ensure[s] that the anterior and posterior surfaces remain separated during suction." EX1001, 4:44-49. It is clear that Petitioner used this teaching as a blueprint for its Park-Baughan combination, which is nothing more than a hindsight reconstruction of the invention. *Insite Vision Inc. v. Sandoz, Inc.*, 783 F.3d 853, 859 (Fed. Cir. 2015) (holding that "defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness"); *ATD Corp. v. Lydall, Inc.*, 159 F.3d 534, 546 (Fed. Cir. 1998) ("obviousness [cannot] be based on the hindsight combination of components selectively culled from the prior art").

**b) A POSITA Would Not Have Been Motivated to Modify Park with Baughan**

Even if, *arguendo*, a POSITA would have recognized that Park's walls may collapse under suction (which they would not), a POSITA would not have looked to modify Park with Baughan and/Johnson. As an initial matter, Petitioner ignores other potential measures for avoiding collapse. For example, if a POSITA believed

that Park's walls may collapse because they are "thin," as Dr. Black suggests, they could easily modify Park to thicken the walls without adding any other features. EX2016, ¶¶152-53. As another example, if a POSITA believed Park's "flexible" material was susceptible collapse, they could simply pick a stronger (yet still sufficiently flexible) material. *Id.* A POSITA would recognize that adding a "bridge structure," as Petitioner suggests, would be more costly and complicated than either of the above options. *Id.* Petitioner and Dr. Black do not explain why Park would need to be modified to include an additional "anti-collapse" structure rather than these alternatives. Petition, 58-65; EX1003, ¶¶131-42.

Baughan is directed to a dental saliva ejector rather than an isolation mouthpiece. EX1007, 1:7-8; EX2016, ¶154. Baughan does describe structures to prevent suction orifices from being blocked, but Baughan is directed to a different problem and geometry than the alleged problem in Park. EX2016, ¶155. In Baughan, the discs 17 prevent the sleeve 24 from blocking the orifices 18 of the terminal tube portion 15, which are the source of suction. EX1007, 3:36-48; EX2016, ¶¶155-56.



EX1007, FIG 3 (excerpted and annotated)

Baughan's discs are designed to prevent a moveable surface (the sleeve 24) from blocking holes providing suction from a fixed surface (the tube 15). *Id.* By contrast, in Park, two surfaces are urged toward one another under suction rather than one surface being urged towards the source of suction. EX2016, ¶156.

Petitioner acknowledges Baughan's fundamentally different geometry that uses "outward projecting discs" around the circumference of an inner cylindrical tube. Petition, 62. Petitioner also acknowledges that Baughan's discs would need to be modified for use with Park and argues that "a PHOSITA using basic common sense, would modify the discs for a tube-shaped embodiment to be projections for a flatter, non-tube embodiment." *Id.*, 62. There are several problems with this assertion.

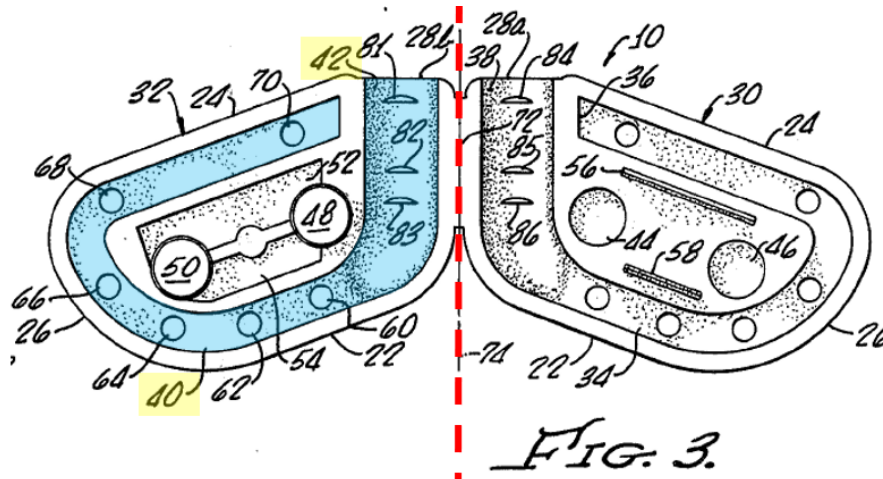
First, Petitioner's reliance on "basic common sense" is an improper use of general knowledge that may not be used to supply a missing claim limitation in an IPR, which must be based on patents or printed publications. None of the references in the Petition disclose a "second wall comprising a bridge structure that includes a plurality of protrusions integral with and protruding from an interior surface of the second wall" as claimed in the '969 Patent. EX2016, ¶157. Petitioner cannot rely on "basic common sense" to fill in this missing element under binding Federal Circuit precedent. *Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1373-77 (Fed. Cir. 2022); *Qualcomm Inc. v. Apple Inc.*, 134 F.4th 1355, 1364-65 (Fed. Cir. 2025).<sup>6</sup>

Second, Johnson does not cure this deficiency in Baughan because it does not teach "projections for a flatter, non-tube embodiment." Petition, 62; EX2016, ¶160. To this point, Dr. Black asserts that "Johnson shows how to form projections 81-86 on a flat surface 40 [in FIG. 3] for dental application." EX1003, ¶137. That is incorrect. EX2016, ¶¶160-64. Johnson describes reference numeral 40 in FIG. 3 as follows: "recess 40 extend[s] from a closed end at the top rear edge of the plate forwardly along the edge of the plate, downwardly along the front edge and

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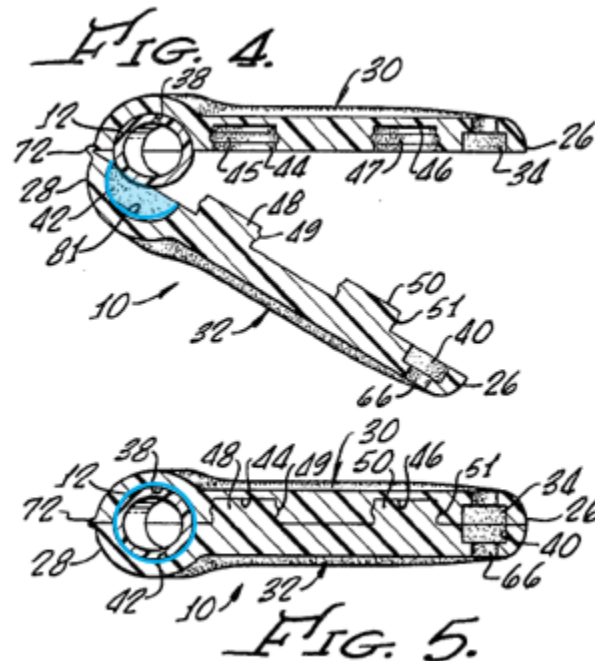
<sup>6</sup> See also July 31, 2025 Memorandum entitled "Enforcement and Non-Waiver of 37 C.F.R. 42.104(B)(4) and Permissible Uses of General Knowledge in *Inter Partes* Reviews."

rearwardly along the bottom edge where it terminates at groove 42 formed in the neck 28b of plate 32.” EX1008, 3:25-30; EX2016, ¶¶161-62. In FIG. 3, plates 30 and 32 “pivot with respect to one another about a hinge axis (denoted by a line 74).” EX1008, 4:11-13; EX2016, ¶163.



EX1008, FIG. 3 (annotated)

As shown more clearly in FIGS. 4-5, for example, when the plates 30 and 32 are closed, the recess 40 is *not* “flat” as asserted by Petitioner and Dr. Black – it is semicircular. EX2016, ¶164.



EX1008, FIGS. 4-5 (annotated)

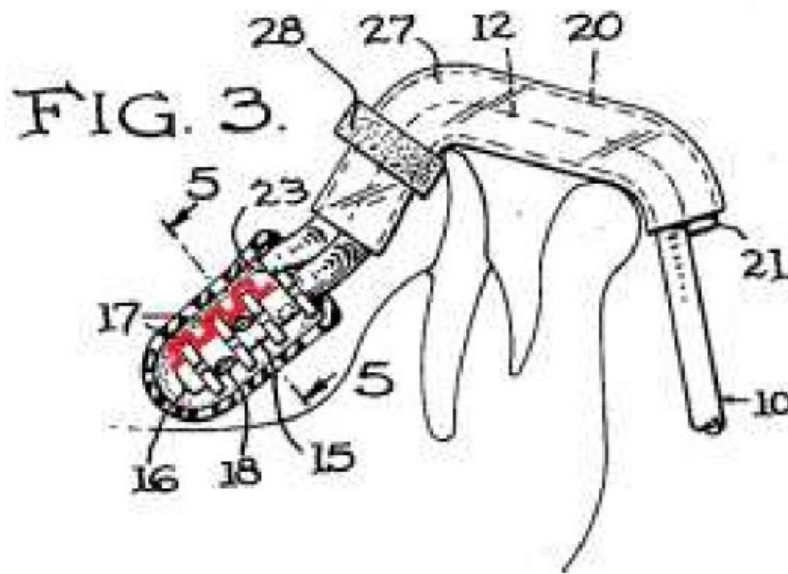
Thus, contrary to Petitioner and Dr. Black's assertions, Johnson does *not* teach "how to form projections 81-86 on a flat surface 40 [in FIG. 3] for dental application." EX1003, ¶137.

Petitioner also argues that if "the discs of Baughan are not 'integral,' it would have been obvious to integrally form projections in view of Park or Johnson." Petition, 64. As discussed above, the claims expressly require that the protrusions are "integral." *Supra*, §V.A. Baughan's discs 17 are not integral – Baughan expressly says that they are "rigidly secured" to the terminal tube portion 15, i.e., they are separate components. EX1007, 2:19-25; EX2016, ¶¶158-59. Petitioner's conclusory obviousness arguments seeking to address this deficiency fail. Petitioner's reliance

on “common knowledge in injection molding” amounts to improper reliance on “general knowledge.” Petition, 64; *Qualcomm*, 24 F.4th at 1373-77; *Qualcomm*, 134 F.4th at 1364-65.

Petitioner's only other argument to address the “integral” requirement is that “it would have been obvious to add projections integrally in view of Johnson,” which allegedly “teaches a plurality of integrally formed projections formed on an inner surface of a dental apparatus.” Petition, 64-65. There are three problems with this. One, Petitioner does not cite Dr. Black for this assertion, so it amounts to unsupported attorney argument. *Id.* Two, contrary to Petitioner's earlier contention, Johnson does not teach forming integral projections on a flat surface. EX2016, ¶¶160-64. Three, the assertion is conclusory and cannot sustain a finding of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“obviousness grounds cannot be sustained by mere conclusory statements”).

Additionally, Petitioner fails to explain *how* a POSITA would modify Baughan's discs for Park's walls and the proposed combination is unclear. Petition, 62-64. For limitation 1(h), Petitioner argues that Baughan's “spaced-apart discs result in a square wave shape having crests and troughs” using the annotation below. Petition, 65.



Petition, 65 (annotating EX1007, FIG. 3)

Petitioner also annotates the entire circumference of the disc 17 as allegedly meeting the “bridge structure” requirement in the claims.



Petition, 66 (annotating EX1007, FIG. 5)

Petitioner does not explain how Baughan's discs would be added to Park, nor does it show what the resulting Park-Baughan combination would look like. Petition, 61-66. If Petitioner is arguing that Baughan's discs would be cut in half (which is

unclear), (1) this is inconsistent with Petitioner's annotation of FIG. 5 of Baughan above and (2) Petitioner does not explain how the cut discs would be attached to one of Park's walls. Petition, 62-64. Petitioner's failure to explain how Park and Baughan would be combined is yet another basis for denying the Petition. *See, e.g., ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327-28 (Fed. Cir. 2012) (obviousness analysis failed to explain specifically how the references would be combined and was not specific to the claim limitations); *Braintree Labs., Inc. v. Novel Labs., Inc.*, 749 F.3d 1349, 1359 (Fed. Cir. 2014) (“[Party] failed to prove ... why the prior art references would have worked together” (cleaned up)); *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-94 (Fed. Cir. 2017) (finding a failure to explain “how the combination of the two references was supposed to work”); *Juniper Networks, Inc. v. Smart Path Connections, LLC*, IPR2021-01356, Paper 27 at 48-50 (PTAB Jan. 19, 2023) (finding petitioner did “not adequately explain[] how [one reference] would be modified to incorporate teachings from [another reference]”).

### **3. Petitioner's Translation Does Not Comply with the Board's Rules**

Park is a Korean patent publication, and Exhibit 1006 purport to be an English translation. EX1006. The Board's rules require that “[w]hen a party relies on a document or is required to produce a document in a language other than English, a translation of the document into English *and an affidavit* attesting to the accuracy

of the translation must be filed with the document. 37 C.F.R. § 42.63(b). The Board's rules define "affidavit" as "affidavit or declaration under § 1.68 of this chapter." 37 C.F.R. § 42.2. In turn, § 1.68 provides:

Any document to be filed in the Patent and Trademark Office and which is required by any law, rule, or other regulation to be under oath may be subscribed to by a written declaration. Such declaration may be used in lieu of the oath otherwise required, if, and ***only if, the declarant is on the same document, warned that willful false statements and the like are punishable by fine or imprisonment, or both (18 U.S.C. 1001)*** . . . . The declarant must set forth in the body of the declaration that all statements made of the declarant's own knowledge are true and that all statements made on information and belief are believed to be true.

37 C.F.R. § 1.68.

Petitioner's translation does not comply with the Board's rules because the "Certification" accompanying Exhibit 1006 is unsworn and was not executed under penalty of perjury:

**Certification**

This is to certify that the foregoing translation of the patent document KR101082826B1 was made from Korean to English from the document by a competent translator well acquainted with both languages, and that, to the best of our knowledge and belief, it is a true and complete rendering into English of the selected text.

Date: April 16, 2025



Donald W. Hanley, CEO

EX1006, 21. There is no sign that the signatory was “warned that willful false statements and the like are punishable by fine or imprisonment.” 37 C.F.R. § 1.68. Moreover, the “Certification” is signed by the translation firm’s CEO rather than the individual(s) who purportedly translated Park from Korean into English. EX1006, 21. There is no identification of who the translator was, what their qualifications are, or, most importantly, a sworn statement from the translator that Exhibit 1006 is an accurate translation. *Id.*; 37 C.F.R. § 42.63(b); 37 C.F.R. § 1.68. Since the firm’s CEO does purport to be a Korean/English translator, it is unclear how he can have sufficient personal knowledge to “certify” that the translation is “true and complete.” EX1006, 21.

The Board has denied institution for non-compliance with the Board’s rules governing translations. *Shenzhen Aurora Tech. Co., Ltd. v. Putco, Inc.*, IPR2020-00670, Paper 10 at 6 (PTAB Aug. 27, 2020) (denying institution because “Petitioner

failed to comply with the Board's rule requiring an affidavit attesting to the accuracy of a translation"); *see also Hengdian Grp. Dmegc Magnetics Co., Ltd. v. Hitachi Metals, Ltd.*, IPR2017-01313, Paper 7 at 5 n.2 (PTAB Nov. 6, 2017) (“The failure to file a proper affidavit with the translation of [a reference] can be a reason to deny institution of any ground related to [that reference]”). Patent Owner submits that the Board can and should find Petitioner did not meet its burden for Grounds 2-4 and deny institution for this additional reason.

**C. Ground 3: Purported Obviousness over Park in view of Baughan, Johnson, and Hirsch (Dependent Claim 10)**

As noted above, in Ground 3, Petitioner only challenges dependent claim 10, which is not obvious over Park for at least the same reasons that the independent claim 1 is not rendered obvious by Park. *Supra*, §VI.B; *Callaway Golf Co. v. Acushnet Co.*, 576 F.3d 1331, 1344 (Fed. Cir. 2009); EX2016, ¶168.

**D. Ground 4: Purported Obviousness over Park in view of Baughan, Johnson, and Black (Dependent Claims 13 and 15)**

As noted above, in Ground 4, Petitioner only challenges dependent claims 13 and 15, which are not obvious over Park for at least the same reasons that the independent claim 1 is not rendered obvious by Park. *Supra*, §VI.B; *Callaway Golf*, 576 F.3d at 1344; EX2016, ¶¶169-71.

### **E. Petitioner's Expert Testimony is Flawed**

Petitioner relies on the testimony of Dr. Black for Grounds 1-5. EX1003. Petitioner argues that a POSITA would have “at least a B.S. degree in mechanical engineering or a related field with at least two years’ experience designing medical devices.” Petition, 29. Dr. Black, on the other hand, offers a different definition that requires an engineering *or* dentistry degree. EX1003, ¶44. Even so, Dr. Black admits that “some knowledge of mechanical engineering is probably required.” EX1004, 3; EX1003, ¶49. Dr. Black does *not* testify that he meets Petitioner’s definition, nor does the Petition explain how he meets Petitioner’s narrower definition through equivalent experience. EX1003, ¶¶49. Petitioner does not contend that mechanical engineering and dentistry are “related field[s].” Petition, 29; Paper 7 at 25-26.

This discussion is not meant to disparage Dr. Black. Petitioner created this problem for itself by proposing an education requirement that its own expert does not meet. Petitioner could have used Dr. Black’s broader POSITA definition (which he meets) but, for whatever reason, chose not to. With this inconsistency exposed in the discretionary denial briefing, Petitioner argues (without citing any evidence) that Dr. Black’s “numerous years designing and pursuing patent protection on his own dental mouthpiece” is sufficient, but it is unclear how “designing and pursuing patent protection” for a product is equivalent to an engineering degree. Paper 7 at 26.

Dr. Black's testimony does not support the Petition because an expert opining on patentability must possess the minimum level of skill in the art. *See, e.g., Kyocera Senco Indus. Tools Inc. v. ITC*, 22 F.4th 1369, 1376 (Fed. Cir. 2022) (excluding expert who was "not at a minimum an ordinarily skilled artisan"); *Extreme Networks, Inc. v. Enterasys Networks, Inc.*, 395 F. App'x 709, 715 (Fed. Cir. 2010) (excluding expert that did not meet definition for a POSITA). Expert testimony is required for anticipation. *Schumer v. Lab. Computer Sys., Inc.*, 308 F.3d 1304, 1315-16 (Fed. Cir. 2002) ("testimony concerning anticipation must be testimony from one skilled in the art"); *see also Koito Mfg. Co. v. Turn-Key-Tech, LLC*, 381 F.3d 1142, 1152 (Fed. Cir. 2004) (accord). Similarly, for obviousness, expert testimony is "required not only to explain what the prior-art references disclosed, but also to show that a person skilled in the art would have been motivated to combine them." *Alexsam, Inc. v. IDT Corp.*, 715 F.3d 1336, 1348 (Fed. Cir. 2013).

Petitioner's reliance on Dr. Black's testimony is also flawed insofar as Petitioner relies on testimony regarding his own subjective views as the author of Black (EX1005). For example, in Ground 1, for limitation 19(f), Petitioner cites Dr. Black's testimony that "I wrote Black and *I know there is a connecting wall* formed at that spot. I invented it." Petition, 45 (citing EX1003, ¶104). Petitioner argues that "the inventor of Black testified that such a connecting wall is present in the tongue aspirator 340." Petition, 46 (citing EX1003, ¶¶105-07). As another example, for

limitation 19(c), Petitioner argues that “[a]ccording to the inventor [Dr. Black], these circles are perforations.” Petition, 40 (citing EX1003, ¶¶89-91); *see also* Petition, 76 (“the inventor of the patent, Dr. Brian P. Black, testified that the holes shown in those figures are perforations”). Dr. Black claims: “***I know*** these are perforations [in FIG. 23B of Black] because ***I am the author*** of this reference.” EX1003, ¶¶90-91. As yet another example, Dr. Black states that if “‘corresponding edges along one or more corresponding sides’ means a wall identical in size and shape, ***I foresaw*** such an embodiment before the priority date of the ‘969 Patent.” *Id.*, ¶94.

Dr. Black’s testimony about what he allegedly meant or contemplated when writing Black is improper because it is not framed from the perspective an objective POSITA’s understanding of Black. An inventor’s testimony about their own patent is entitled to little, if any, weight. *See Roton Barrier, Inc. v. Stanley Works*, 79 F.3d 1112, 1126 (Fed. Cir. 1996) (stating that “an inventor's after-the-fact testimony is of little weight compared to the clear import of the patent disclosure itself”) (internal quotation marks omitted); *see also Bell & Howell Document Mgmt. Prods. Co. v. Altek Sys.*, 132 F.3d 701, 706 (Fed. Cir. 1997) (“the testimony of an inventor often is a self-serving, after-the-fact attempt to state what should have been part of his or her patent application”); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 985 (Fed. Cir. 1995) (“The subjective intent of the inventor when he used a particular term is of little or no probative weight in determining the scope of a claim”).

Petitioner's attempt to use Dr. Black's *ipse dixit* testimony about what he personally contemplated but did not disclose in Black should be disregarded.

## VII. CONCLUSION

For at least the foregoing reasons, the Petition should be denied as to each of the requested grounds. For brevity, Patent Owner may not have addressed all characterizations of the applied references and the challenged claims and reserves the right to do so should institution be granted. The absence of a response by Patent Owner to any of the positions presented in the Petition or the associated expert declaration is not a concession to those positions. The fact that Patent Owner's Preliminary Response has focused on particular arguments is not a concession that there are no other arguments for patentability of the challenged claims.

Respectfully submitted,

Dated: September 18, 2025

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**CERTIFICATE OF SERVICE**

The undersigned hereby certifies that a copy of the foregoing **Patent Owner's Preliminary Response** was served on September 18, 2025, by email:

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