UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ASCENTCARE DENTAL PRODUCTS, INC.
Petitioner

v.

SOLMETEX, LLC
Patent Owner

Patent No. 11,589,970
Issue Date: February 28, 2023
Title: INTERORAL DEVICE WITH DETACHABLE MOUTH PROP

Inter Partes Review No. IPR2025-01057

PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 11,589,970
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42

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LISTING OF CLAIMS

U.S. Patent No. 11,589,970 (Claims 1-4 and 7-18)

Claim Designation	Claim Language
Independent Claim 1 Preamble/ Limitation 1(a)	1. A mouthpiece comprising:
Limitation 1(b)	a main body portion configured as a pocket at least partially enclosing an interior space that extends from a first end to a second end of the main body portion, the pocket defined by:
Limitation 1(c)	a first wall extending from the first end to the second end, wherein the first wall is narrower at the second end than at the first end,
Limitation 1(d)	a second wall located at a distance from the first wall and extending from the first end to the second end, wherein the second wall is also narrower at the second end than at the first end,
Limitation 1(e)	the second wall comprising a bridge structure that includes a plurality of protrusions integral with and protruding from an interior surface of the second wall and extending across the distance between the first wall and the second wall, wherein the bridge structure is not attached to the first wall,
Limitation 1(f)	and wherein 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, and
Limitation 1(g)	a connecting wall that connects one or more edges of the first wall to one or more corresponding edges of the second wall across the distance between the first wall and the second wall;
Limitation 1(h)	a suction connector extending from the first end of the main body portion and integral to the main body portion, the suction connector including a cavity extending longitudinally from the main body portion, the cavity in communication with the interior space of the pocket and extending from a first opening of the suction connector at the first end of the main body

	portion and through a length of the suction connector towards a suction port opening opposite from the main body portion; and
Limitation 1(i)	a mouth prop molded in one piece, and wherein the suction connector extends through and past the mouth prop.
Claim 2	2. The mouthpiece of claim 1, wherein the mouth prop comprises a bite block portion and a strap portion, wherein the strap portion corresponds to a circumference of the suction connector, wherein a cross section of an opening of the strap portion is parallel to the cross section of the first opening of the suction connector and parallel to the cross section of the suction port opening, wherein a first edge and a second edge of an external surface of the strap portion are adjacent to an external surface of the suction connector, wherein the first edge is opposite the second edge, and wherein the strap portion is injection-molded in a single piece with the bite block portion.
Claim 3	3. The mouthpiece of claim 2, wherein the strap portion is elastic.
Claim 4	4. The mouthpiece of claim 2, wherein an external surface of the suction connector comprises a notch region corresponding to the strap portion, the notch region separating the external surface into a first surface and a second surface and defining an interior surface coupled to the first surface by a first side wall and coupled to the second surface by a second side wall.
Claim 7	7. The mouthpiece of claim 2, wherein the suction connector further comprises an external plug protrusion corresponding to an opening through the bite block portion.
Claim 8	8. The mouthpiece of claim 7, wherein the plug protrusion fits into the opening through the bite block portion to provide additional crush-resistance and decreased compressibility during biting by a patient.
Claim 9	9. The mouthpiece of claim 1, wherein the suction connector comprises a cutout corresponding to a protrusion on a vacuum adapter for an interlocking fit.
Claim 10	10. The mouthpiece of claim 1, wherein the suction connector connects the interior of the pocket to a vacuum source, wherein activation of the vacuum source provides suction of fluids from the interior of the pocket toward the vacuum source.

Claim 11	11. The mouthpiece of claim 1, wherein at least one of the first wall, the second wall, or the connecting wall comprise a plurality of perforations.
Claim 12	12. The mouthpiece of claim 11, wherein activation of a vacuum source associated with suction connector extending from the first end of the main body portion draws fluids from an exterior of the main body portion through one or more of the plurality of perforations into the interior space of the pocket of the main body portion.
Claim 13	13. The mouthpiece of claim 1, further comprising a cheek retractor portion connected to the main body portion and having a surface that applies pressure when bent, wherein the pressure is based on resilience of the cheek retractor portion.
Claim 14	14. The mouthpiece of claim 1, wherein the second wall further includes a stability bar protruding from an interior surface of the second wall and along a longitudinal axis of the main body portion.
Claim 15	15. The mouthpiece of claim 1, wherein the main body portion is formed by injection-molding as one piece.
Claim 16	16. The mouthpiece of claim 1, wherein a material that forms the main body portion is a flexible, translucent, high heat-resistant, autoclavable silicone-based material.
Claim 17	17. The mouthpiece of claim 1, wherein the mouth prop is interchangeable with a second mouth prop that is attachably and detachably associated with the main body portion, the second mouth prop being of a different size.
Independent Claim 18 Preamble/ Limitation 18(a)	18. A mouthpiece comprising:
Limitation 18(b)	a main body portion configured as a pocket at least partially enclosing an interior space that extends from a first end to a second end of the main body portion, the pocket defined by:
Limitation 18(c)	a first wall extending from the first end to the second end, the first wall having an interior surface facing the interior space of the pocket, and
Limitation 18(d)	a second wall located at a distance from to the first wall and extending from the first end to the second end, the second wall

	having an interior surface facing the interior surface of the first wall,
Limitation 18(e)	the second wall comprising a bridge structure that includes a plurality of protrusions integral with and protruding from the interior surface of the second wall and extending across the distance between the first wall and the second wall, wherein the bridge structure is not attached to the first wall, and wherein 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, and
Limitation 18(f)	a connecting wall that connects one or more edges of the first wall to one or more corresponding edges of the second wall across the distance between the first wall and the second wall;
Limitation 18(g)	a mouth prop molded in one piece and located at the first end of the main body portion; and
Limitation 18(h)	a suction connector integral with the main body portion and extending from the first end of the main body portion past the mouth prop, wherein the suction connector includes a cavity in communication with the interior space of the pocket.

I. FORMALITIES

A. Mandatory notices (37 C.F.R. § 42.8(a)(1))

1. Real Party in Interest (37 C.F.R. § 42.8(b)(1))

Petitioner Ascentcare Dental Products, Inc. ("Ascentcare") is the real party-in-interest in this petition. Ascentcare is the defendant in the related proceeding identified in Section 1(A)(4).

2. Designation of Lead and Backup Counsel (37 C.F.R. § 42.8(b)(3))

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3. Notice of Service

Please direct all correspondence to lead counsel at the above address. Petitioner also consents to email service at the above email addresses for lead and back-up counsel.

4. Related Proceedings

U.S. Patent No. 11,589,970 is presently asserted in *Solmetex, LLC v. Ascentcare Dental Products, Inc.*, Case No. 1:24-cv-00954 (W.D. Mich). The Complaint (EX1009) was served on December 10, 2024 (EX1010). Thus, this Petition is filed within one year after Ascentcare was served with a complaint for infringement. Ascentcare has not filed a separate civil action challenging the validity of the ’970 Patent.

Petitioner also filed an *inter partes* review petition on a related patent (U.S. 11,589,970) also asserted in *Solmetex, LLC v. Ascentcare Dental Products, Inc.*, Case No. 1:24-cv-00954. The proceeding number is IPR2025-01020.

B. Grounds for Standing

Petitioner hereby certifies the ’970 Patent is available for *inter partes* review, and Petitioner is not barred from requesting an *inter partes* review challenging the patent claims on the Grounds identified in the petition.

C. Procedural Statements

This Petition is filed in accordance with 37 C.F.R. § 42.106(a). A Power of Attorney (37 C.F.R. § 42.10(b) and Exhibit List (37 C.F.R. § 42.63(e)) are filed concurrently with this Petition. The fee is being paid via Deposit Acct. No. 50-0223. The United States Patent and Trademark Office is authorized to charge any fee deficiencies, or credit any overpayment, to Deposit Acct. No. 50-0223.

II. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42, the undersigned, on behalf of and representing Ascentcare, petitions for *inter partes* review of claims 1-4 and 7-18 of U.S. Patent No. 11,589,970, entitled "Intraoral Device with Detachable Mouth Prop" ("the ""970 Patent"), issued to Thien Nguyen and assigned to Solmetex, LLC ("Solmetex"). EX1001.

The '970 Patent discloses an enclosed dental mouthpiece with sidewalls. EX1001, FIG. 1A, 3:45-50; EX1003, ¶¶ 2, 26-31. The mouthpiece depicted and described by the '970 Patent follows the same general shape of prior art isolation mouthpieces known for decades. *See* EX1005, FIG. 4C; EX1005, FIG. 2; EX1012, FIG. 19A; EX1013, FIG. 1; EX1016, FIG. 1; EX1001, FIG. 1B.

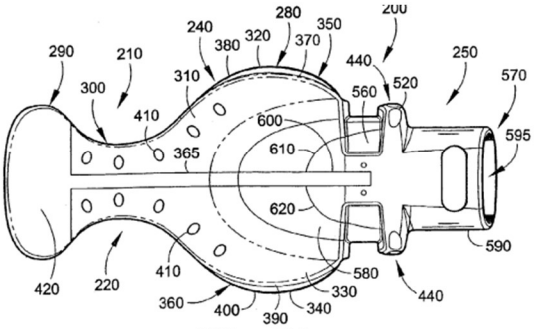


FIG. 19A

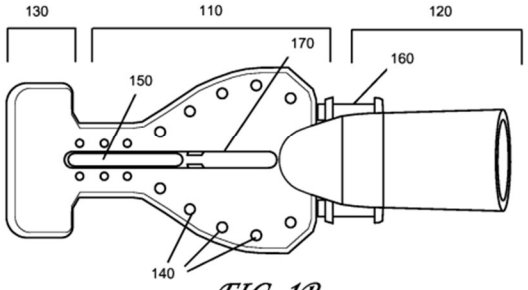
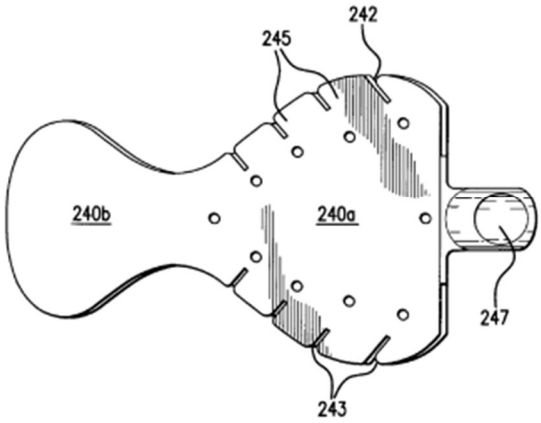
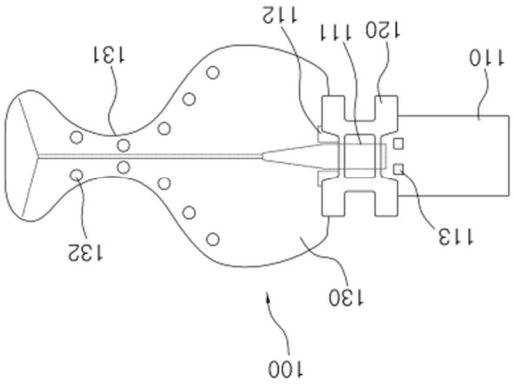


FIG. 1B





Originally, Patent Owner was content claiming a dental mouthpiece with enclosing sidewalls connecting an anterior wall to a posterior wall, as clearly shown in FIG. 1A (and all other figures in the specification). EX1014, claim 1; EX1002, pp. 30 and 77.

However, through an aggressive continuation application practice aimed at Petitioner's product, Patent Owner sought exceedingly broad patent protection. Currently, Patent Owner has filed at least *seventeen* continuation applications stemming from the parent application. The '970 Patent resulted from one such continuation application.

Prosecution of the ’970 Patent lasted almost 9 years, and the prosecution history demonstrates a conspicuous shift in claim scope only one month after Petitioner released a very different product that, like much of the prior art predating the ’970 Patent, lacks enclosing sidewalls that connect a posterior wall to an anterior wall. EX1020, pp. 354. The ‘970 Patent and all of its subsequent continuation applications are no longer limited to claims having “sidewalls.” Rather, they recite a “connecting wall,” which, according to Patent Owner, can be any structure that connects anterior and posterior walls. EX1011, p. 6. Notably, almost all prior art dental isolation mouthpieces disclose a connecting wall that satisfies Patent Owner’s new interpretation of the ’970 Patent’s claim language. EX1005, FIGs. 1, 4C, 13; EX1012, FIG. 18B; EX1013, FIG. 1.

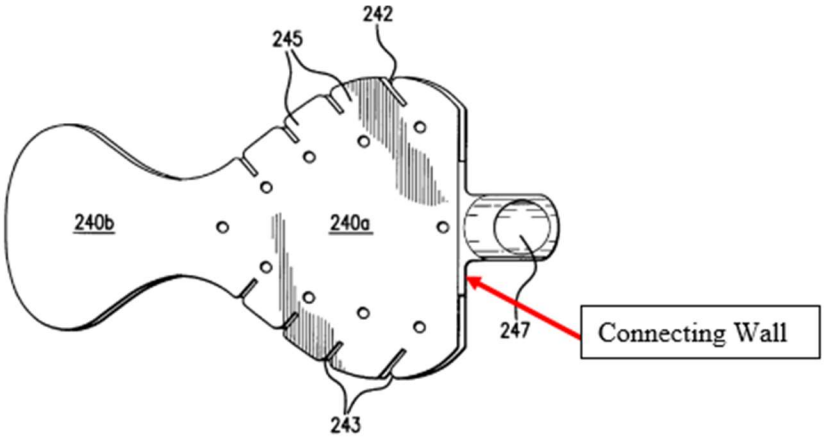


FIG.4C

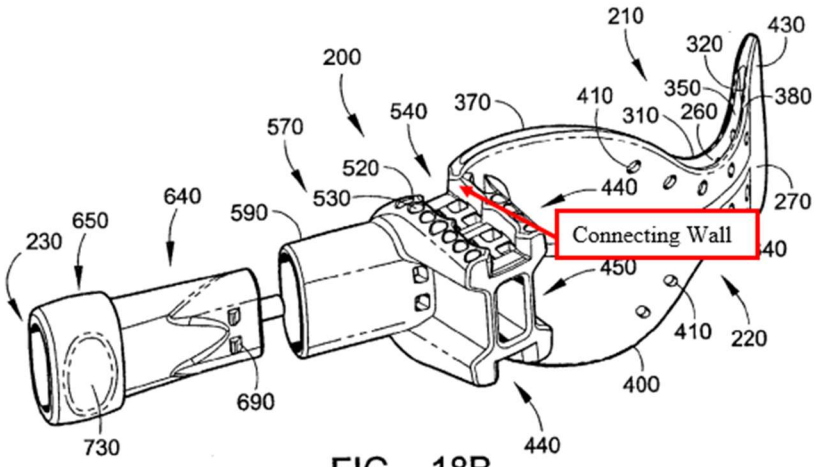
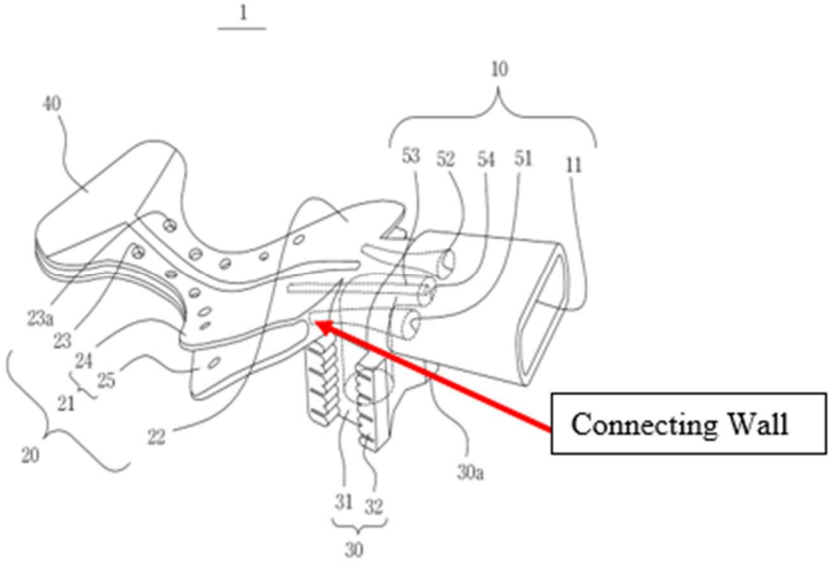


FIG. 18B



Understandably, in view of Patent Owner's very specific and nuanced arguments illustrating the importance of enclosing sidewalls in a co-pending application before the same Examiner, the Examiner does not appear to have appreciated the impact of Patent Owner's broadening effort. EX1022. To this end, Patent Owner went to great lengths explaining and showing what they believed they invented, coloring the Examiner's understanding. In taking these new positions,

Patent Owner completely disregarded the prosecution history of the parent application and statements it previously made to the Examiner.

These attempts to broaden claim scope resulted in the Examiner allowing claims that recaptured claim scope that Patent Owner willingly surrendered in view of the prior art during prosecution. Therefore, the claims of the '970 Patent are invalid for overbreadth.

A petition for *inter partes* review must demonstrate "a reasonable likelihood that the petitioner would prevail with respect to at least one of the claims challenged in the petition." 35 U.S.C. § 314(a). The Petition meets this threshold.

III. STATEMENT OF THE PRECISE RELIEF REQUESTED AND THE REASONS THEREFOR (37 C.F.R. § 42.22(A))

Petitioner respectfully requests a final written decision that claims 1-4, and 7-18 of the '970 Patent are unpatentable in light of 35 U.S.C. § 103. Claims 1 and 18 are independent.

Petitioner requests *inter partes* review of the '970 Patent based on the following references, all of which were filed, issued, or published prior to the earliest priority date of the '970 Patent, which is Dec. 7, 2012[1]. The prior art relevant to this

[1] Petitioner does not concede that all claim limitations are entitled to this priority date because the provisional application does not support all claim limitations. Nevertheless, all of the prior art relied upon in the Petition was published more than one year before the provisional application filing date. So, for the purposes of the Petition, it is irrelevant whether the provisional application supports all claim limitations.

Petition includes: Korean Patent No. KR10-1082826 to Park ("Park"), filed on January 20, 2010, and issued on November 11, 2011, U.S. Patent No. 3,101,543 to Baughan ("Baughan"), filed on May 15, 1961 and issued on August 27, 1963, U.S. Patent No. 4,017,975 to Johnson ("Johnson"), filed on March 22, 1976 and issued on April 19, 1977, U.S. Patent No. 8,029,280 to Black ("Black"), filed on Sept. 26, 2008 and issued on October 4, 2011, and U.S. Patent Application Publication No. 2003/0134253 to Hirsch ("Hirsch"), filed on February 27, 2003 and published on July 17, 2003. Black, Park, Baughan, Johnson, and Hirsch are all prior art under 35 U.S.C. § 102(b).

This Petition further relies upon the Declaration of Dr. Brian Black ("Black Decl." (EX1003); Black CV (EX1004)), which is relevant to the skill, knowledge, and expertise of a person having ordinary skill in the art ("PHOSITA") at the time of the invention and how that person would have understood and applied the prior art. The statutory grounds on which the challenge is based on:

(1) Claims 1, 9-13, 15-16, and 18 are obvious under 35 U.S.C. § 103 in view of Park, Baughan, and Johnson.

(2) Claims 2-4, 7-8, and 17 are obvious under 35 U.S.C. § 103 in view of Park, Baughan, Johnson, and Black.

(3) Claim 14 is obvious under 35 U.S.C. § 103 in view of Park, Baughan, and Johnson and Hirsch.

IV. U.S. PATENT NO. 11,589,970 (THE '970 PATENT) (EX1001)

A. Specification and Claims

The '970 Patent describes a dental isolation mouthpiece with the same basic structure of conventional isolation mouthpieces. *E.g.* EX1005, FIG. 18; EX1012, FIG. 19A; EX1013, FIG. 1-2; EX1006, FIG. 2; EX1016, FIG. 1 (among others).

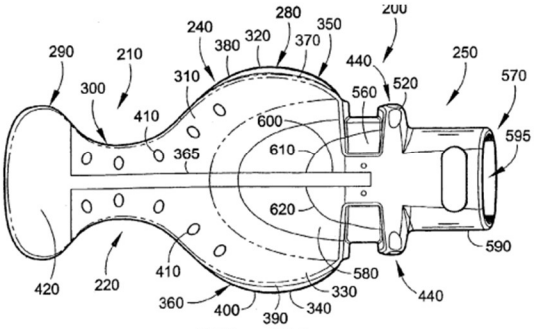


FIG. 19A

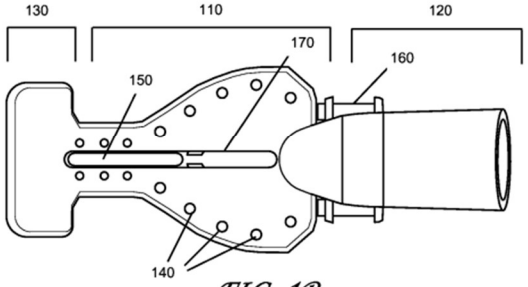
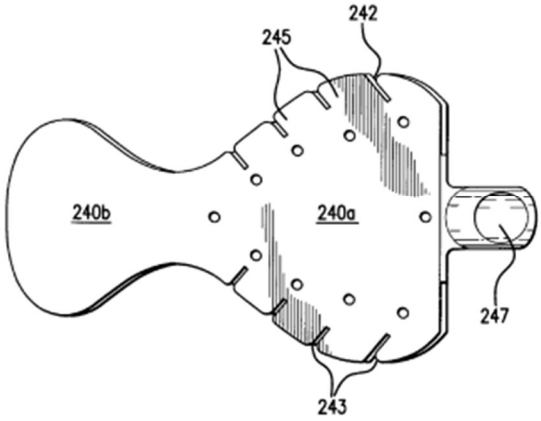
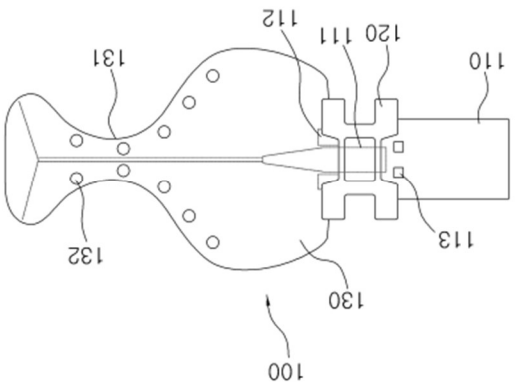


FIG. 1B





A mouthpiece having a suction connector, a bite block, a wider tongue retractor, a narrow isthmus, and a cheek retractor was well-established before the priority date of the '970 Patent. *Id.*

Exactly like the prior art, the ’970 Patent discloses a dental mouthpiece that attaches to a suction adapter and assists in removing fluids and debris from a patient's oral cavity during dental procedures. EX1001, Abstract. The mouthpiece has a main body portion 110, a cheek retractor portion 130, and a suction connector portion 120. EX1001, 3:27-29.

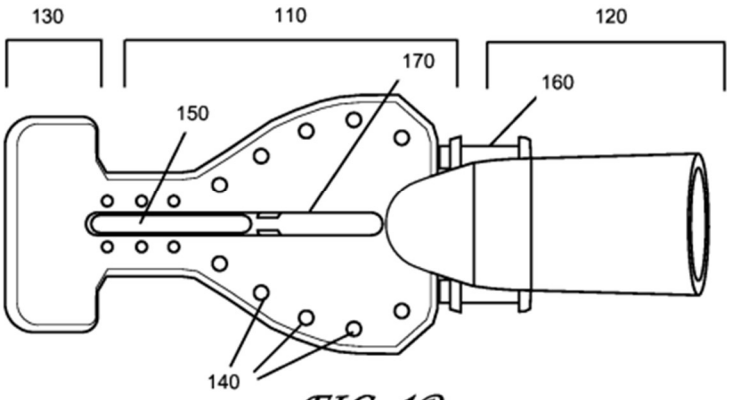


FIG. 1B

The main body portion is configured as a “pocket” with perforations 140 that communicate with an interior space within the pocket. EX1001, 4:9-21. The pocket is formed by an anterior wall, a posterior wall, and superior and inferior sidewalls, each connected to both the anterior and posterior walls, thereby enclosing the pocket. EX1001, 3:45-63. The posterior wall includes a bridge structure having spaced-apart protrusions formed in a “wave shape.” EX1001, 4:48-67.

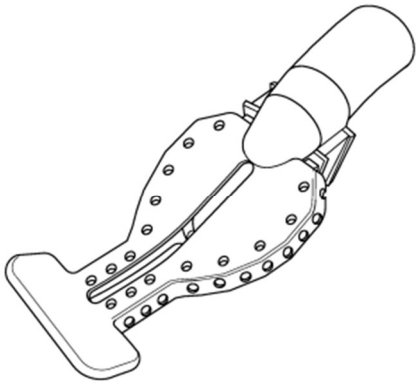


FIG. 1A

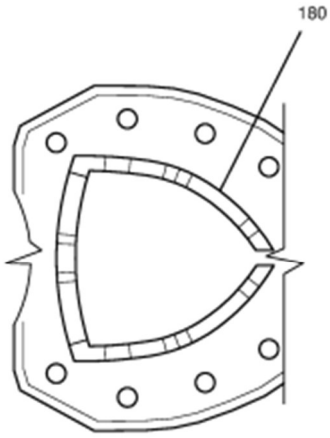


FIG. 5

The bridge structure keeps the anterior and posterior walls separated during suction and allows fluids to pass between the protrusions. *Id.*

B. Prosecution History of the '970 Patent

The '970 Patent was filed on March 27, 2014 and is a continuation application to U.S. Patent No. 8,911,232. EX1001, (22), (63). The '970 Patent, despite being filed in 2014, did not issue until 2023 (just under 9 years of prosecution). EX1001, (45). The '970 Patent claims a priority date of December 7, 2012, which was the filing date of a provisional application. EX1001, (63).

U.S. 8,911,232 ("the '232 Patent") includes claims reciting a dental mouthpiece having a pocket defined by an anterior wall, a posterior wall, and a sidewall. EX1014; claim 1. Notably, originally-presented claims of the application that resulted in the '232 Patent recited "a main body portion comprising a defined pocket having an anterior wall, a posterior wall, and a side wall in between the

anterior wall and the posterior wall, wherein the anterior wall, the posterior wall, and the side wall define an interior portion of the defined pocket." EX1015, p. 24.

During prosecution of the '232 Patent, the Examiner cited Black as a secondary reference to teach "a bridge structure protruding from an interior surface of the posterior wall, the protruding structure comprising a plurality of spaced contact points that keep the anterior wall separated from the posterior wall during suction." EX1015, pp. 51-52. Specifically, the Examiner pointed to transverse walls 48c shown in FIG. 3b of Black. *Id.*

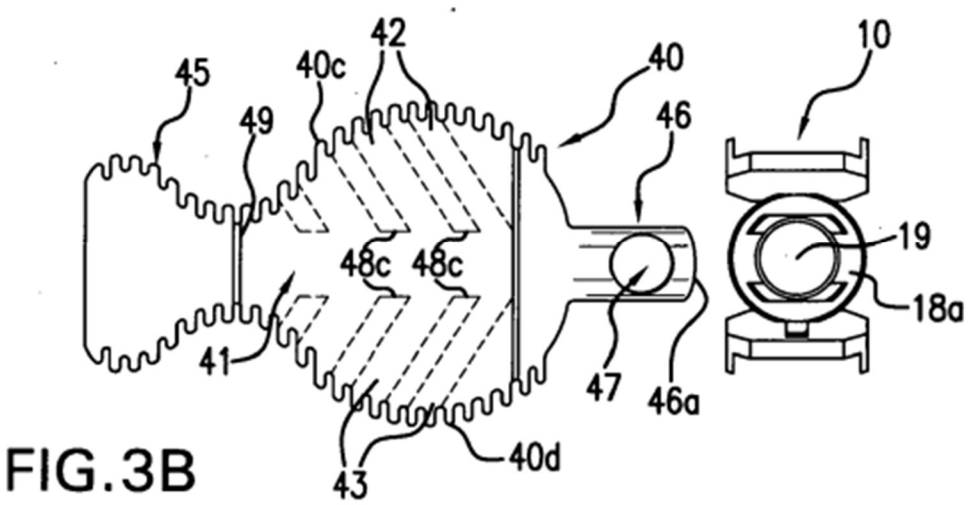


FIG.3B

In the first Office Action, the Examiner said, "Black et al. discloses an intraoral suction device comprising a wave-shaped bridge structure 48c having formed therein the interior wall of the device 40 (FIG. 3B; paragraph 80). Note that the troughs between bridges/transverse walls 48c allow for communication with the suction source." *Id.* In response to the First Office Action, Patent Owner focused its

arguments on the primary reference, and only said this about Black: "Likewise, *Black* was merely relied upon to teach the claimed 'bridge structure' recited in dependent claims 8-10. *Black*... lacks any teaching that would teach the claim limitations of independent claim 1 that are missing from [primary reference]." EX1015, pp. 91-93. In other words, Patent Owner did not expressly disagree with the Examiner's rejection of dependent claims 8-10, did not argue that the Examiner erred in suggesting that Black teaches a bridge structure, or in any way argue against this interpretation of Black or the conclusion that Black taught a bridge structure.

In the Second Office Action, the Examiner again cited Black, but noted that claim 9, which recited that contact points of the bridge structure formed a wave shape with contact points at crests of the wave shape, was now allowable over Black (and the primary reference). EX1015, pp. 109-111. The Examiner provided no reason why this limitation was allowable now but not in the First Office Action. Importantly, however, the Examiner found that Black taught "a bridge structure protruding from an interior surface of the posterior wall, the protruding bridge structure comprising a plurality of spaced contact points that keep the anterior wall separated from the posterior wall during suction." EX1015, p. 110. Patent Owner accepted the allowable subject matter of claim 9 and received an allowance. EX1015, pp. 130, 140.

After obtaining an allowance that resulted in the ’232 Patent, Patent Owner filed a continuation application, which became the ’970 Patent, seeking broader protection. EX1002, p. 30. The original independent claim presented during prosecution of the ’970 Patent recited very few claim limitations all directed to the main body portion of the mouthpiece. *Id*. Importantly, one of those limitations was “a side wall connecting an edge of the anterior wall to an edge of the posterior wall”. *Id.* These claims faced the same prior art rejections as the ’232 Patent, including Black. EX1002, pp. 184-186. This time, Applicant argued that Black failed to teach the bridge structure as claimed in dependent claim 13 because the claim language recited that the bridge structure was unattached to the anterior wall, while Black’s transverse walls attached to both the posterior and anterior walls. EX1002, pp. 289-290, 312-313. In response, the Examiner cited Hirsch. EX1002, p. 387.

After this point, Applicant began to pursue features related to the removable bite block, but the Examiner rejected these features, often citing Black. *e.g.* EX1020, pp. 171-176. However, none of these features are in the independent claims of the ’970 Patent. EX1001, claims 1 and 18. Throughout these amendments, the claims always recited at least one sidewall. *E.g.* EX1020, p. 278.

The sidewall and removable bite block limitations remained until Patent Owner's January 22, 2021[2] amendment that canceled these limitations and attempted to pursue a mouthpiece lacking any sidewalls at all. EX1020, pp. 354. Patent Owner also introduced a new claim 24 (now claim 18) that claimed only two walls, one of which having the bridge structure. EX1020, p. 355.

The Examiner issued an essential elements rejection in response to the omission of a sidewall, so Patent Owner added a new limitation reciting a "connecting wall" rather than a "sidewall". EX1020, pp. 365, 434. Patent Owner argued that the connecting wall is merely "an element between the first and second wall," telegraphing its new claim construction devoid of the specification. EX1020, p. 436; EX1011, p. 6. Eventually, the claims were allowed. EX1021, pp. 248; EX1003, ¶¶ 32-41.

V. A PERSON HAVING ORDINARY SKILL IN THE ART

The prior art and the Black Declaration demonstrate that a PHOSITA, at the time the '970 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

[2] Notably, Petitioner launched its own non-infringing, unenclosed, competing product in December 2020, just a month before the dramatic shift in claim scope.

level of education, such as a master's degree, and vice versa. EX1003, ¶¶ 42-51, *see also* ¶¶ 1-25.

VI. CLAIM CONSTRUCTION UNDER 37 C.F.R. § 42.104(B)(3)

Unless otherwise addressed herein, the terms of the '970 Patent's claims are to be given their plain and ordinary meaning, as understood by one of ordinary skill in the art, in view of the '970 Patent's specification. *See* 37 C.F.R. § 42.100(b); 83 FR 51340; *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). To the extent there is any departure from the plain and ordinary meaning, Petitioner adopted Patent Owner's constructions implied from its overly broad infringement contentions to demonstrate invalidity. EX1011; EX1003, ¶¶ 52-56.

Patent Owner appears ready to assert a much broader meaning of some terms that are not defined in the specification. For example, Patent Owner has accused Petitioner's product of infringing at least claim 1 of the '970 Patent by pointing to two flaps of very different sizes and shapes as "corresponding," and also pointing to a bite block as a "connecting wall" of the main body despite the '970 Patent (i) describing the main body being *separate* from the mouth prop, and (ii) even going so far as to describe the mouth prop as detachable. EX1001, 5:21-39.

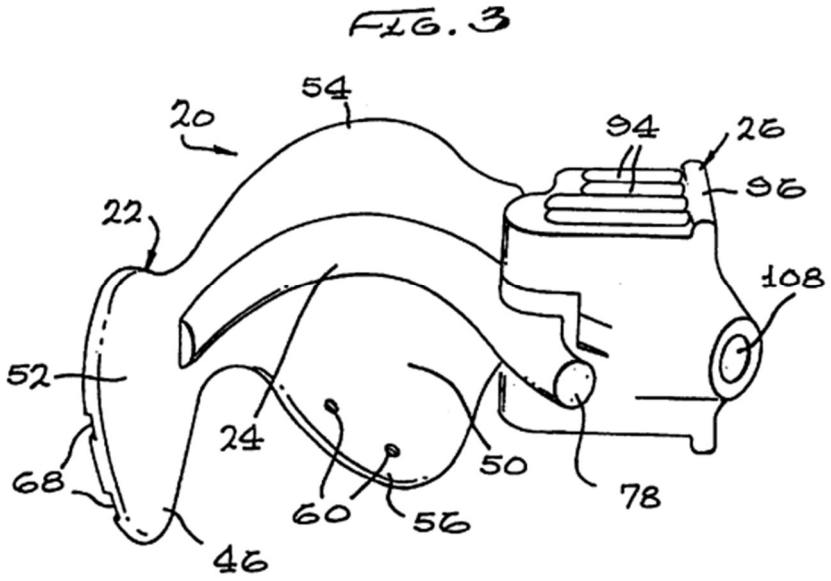
The parties are likely to dispute the scope of several terms, such as "end," "edge," "corresponding shape," and "interior surface," EX1011. Nevertheless, all claims of the '970 Patent are invalid under either party's construction.

Notwithstanding its likely suggestion to the contrary, Patent Owner did not invent a dental isolation mouthpiece that prevents suction collapse, nor did it invent a dental isolation mouthpiece with a wall that connects an anterior wall to a posterior wall at an edge of the mouthpiece.

VII. BACKGROUND OF DENTAL MOUTHPIECES AND THE PRIOR ART RELIED UPON IN THIS PETITION

Dentists have isolated tissue and used suction during dental procedures for many years. EX1016, 2:42-46; EX1017; EX1003, ¶ 3, 10-11, 48.

The modern style isolation mouthpiece appears to have started with James Hirsch in 2001 (EX1018). Hirsch taught a suction connector, a bite block for engaging teeth on one side of the mouth, a wide main body that fits into the intraoral cavity for tongue isolation, a narrow neck for wrapping around teeth on the other side of the mouth, and a cheek retractor. EX1018, Abstract. The ’970 Patent (and many like it) follows this same general style and structure. EX1003, ¶ 27.



Hirsch improved on his design in 2003. EX1012, FIG. 19A; EX1001, FIG. 1B. The ’970 Patent closely resembles this improved design.

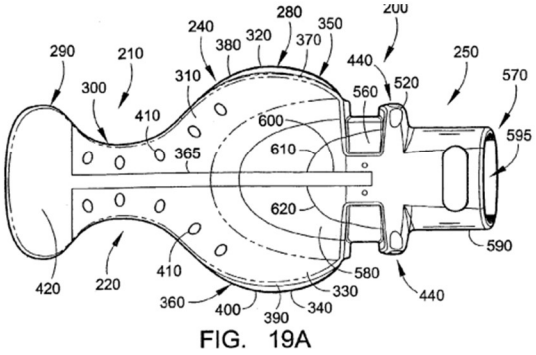


FIG. 19A

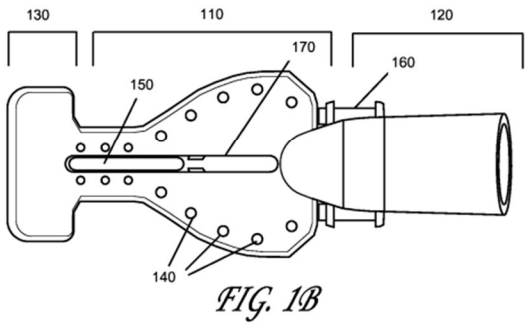


FIG. 1B

A. Prior Art Patents and Printed Publications Relied Upon

1. Black

Black teaches a dental isolation mouthpiece with the same basic shape as the ’970 Patent. EX1001, FIG. 1B; EX1005, FIG. 4C.

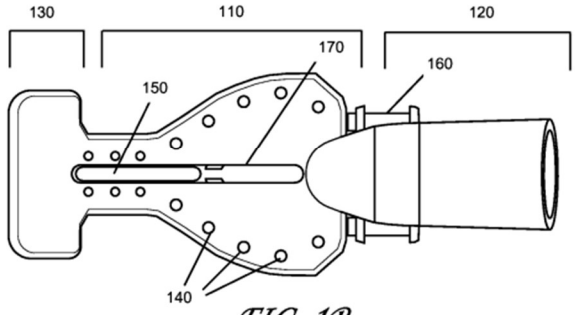
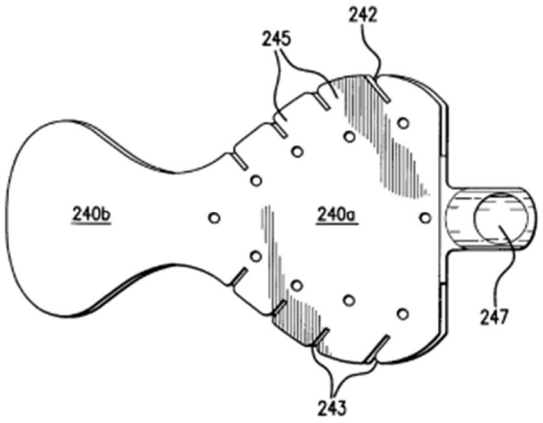


FIG. 1B

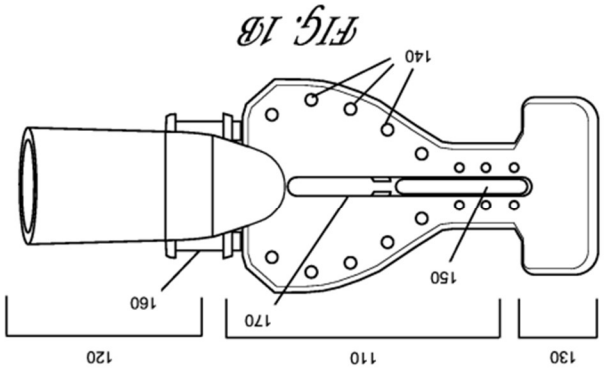


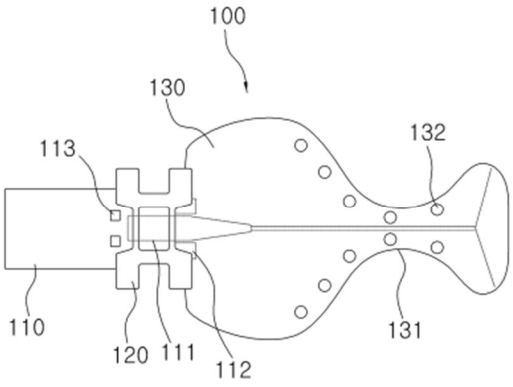
Black discloses several embodiments of an open tongue aspirator teaching an anterior layer that corresponds in size and shape to a posterior layer with transverse walls connecting the anterior layer to the posterior layer. EX1005, 5:21-59, 14:21-47. The transverse walls form channels therebetween and prevent the anterior and posterior layers from collapsing under suction. *Id.*; EX1003, ¶¶ 57-60.

Black also teaches a removable bite block. EX1005, 2:1-7, 15:36-51.

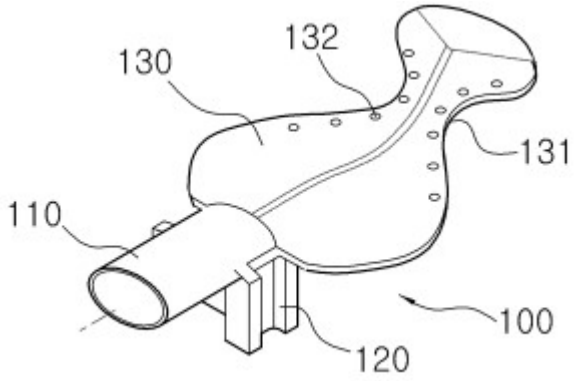
2. **Park**

Park teaches an enclosed dental isolation mouthpiece with the same basic shape as the ’970 Patent. EX1001, FIG. 1B; EX1006, FIG. 3.



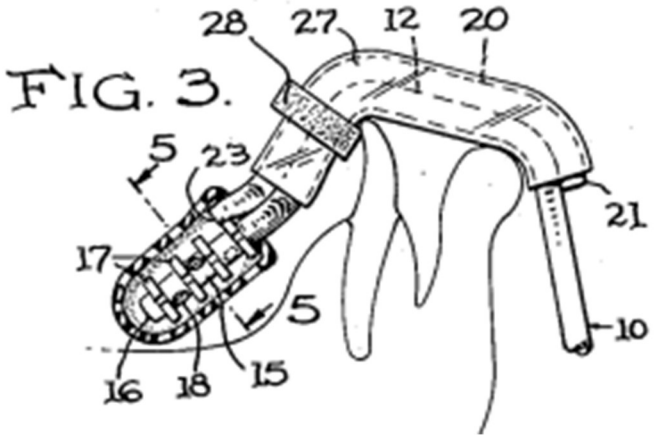


More specifically, Park teaches a mouth prop 100 that includes a hollow insertion port 110 that receives a suction line, a tooth support section 120 that engages a patient's teeth, and a tongue retractor 130 extending from the insertion port 110 and including a concave region 131 and a cheek retractor. EX1006, Abstract, FIG. 2, FIG. 6. Park shows suction ports 112 extending from the insertion port 110 into the tongue retractor 130 and fluidly connecting to through holes 132 formed on both the anterior and posterior wall of the tongue retractor 130. EX1006, ¶¶ 26-29, 31, 42, FIG. 2; EX1003, ¶¶ 61-63. Park depicts sidewalls connecting the anterior wall to the posterior wall of the mouthpiece. EX1006, FIG. 2.



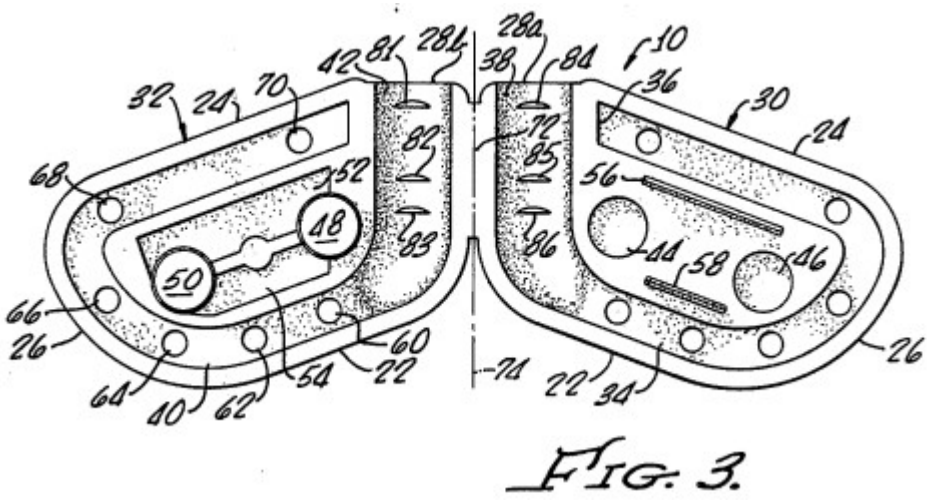
3. **Baughan**

Baughan teaches a saliva ejector that includes projecting discs 17 that prevent a sleeve 24 from collapsing upon a suction tube 15 during applied suction. EX1007, 3:43-48, FIGs. 2-3; EX1003, ¶¶ 64-66. The discs 17 are spaced apart from each other and form a wave shape. *Id.*



4. **Johnson**

Johnson teaches integral projections 81-86 formed on a flat surface in a dental apparatus. EX1008, 4:16-23, FIG. 3; EX1003, ¶¶ 67-69. Johnson also teaches the use of injection molding for creation of plastic, dental apparatuses as a single piece. EX1008, 5:20-31, 4:5-16; EX1003, ¶ 67.



5. **Hirsch**

Hirsch also teaches a dental isolation mouthpiece with the same basic shape as the ’970 Patent. EX1001, FIG. 1B; EX1012, FIG. 19A; EX1003, ¶ 70.

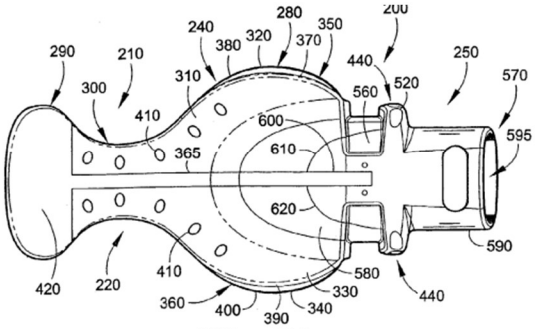


FIG. 19A

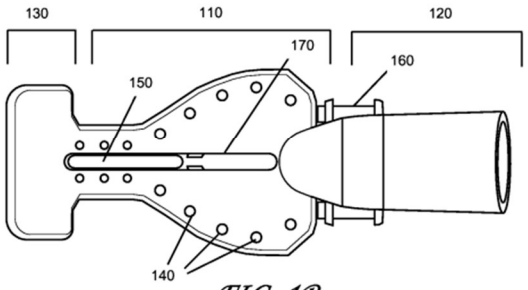


FIG. 1B

Hirsch teaches a dental isolation mouthpiece having a spine formed along a longitudinal axis of the isolation mouthpiece. EX1012, ¶ 78.

VIII. DISCRETION UNDER § 325(D) AND § 314

Pursuant to the guidance included in the "FAQs for Interim Processes for PTAB Workload Management," Petitioner omits any preemptive arguments against discretionary denial. Petitioner will present arguments in an Opposition Brief, should Patent Owner file a Discretionary Denial Brief.

IX. GROUNDS FOR UNPATENTABILITY

Petitioner requests cancellation of the challenged claims on the following Grounds. EX1003, ¶¶ 71-79.

A. Ground 1: Claims 1, 9-13, 15-16, and 18 are obvious under 35 U.S.C. § 103 in view of Park, Baughan, and Johnson

1. Independent Claim 1

a. **Limitation 1(a)**[3]

Because the claim body fully sets forth the complete claimed structure, and the preamble merely describes an intended use of the dental mouthpiece, the preamble does not instill patentable weight. *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999); *see also Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997); MPEP 2111.02(II); EX1003, ¶ 80.

To the extent the preamble is limiting, Park discloses a mouth prop 100, which is a mouthpiece. EX1006, ¶¶ 25-26; EX1003, ¶ 81.

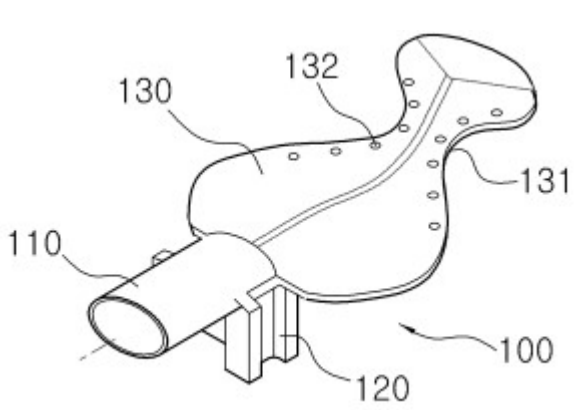
b. **Limitation 1(b)**

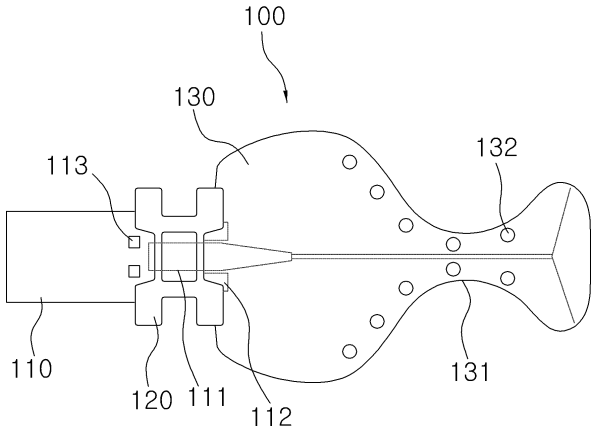
Park discloses a tongue retractor 130, which is a main body. EX1006, ¶ 26; EX1003, ¶ 82. As shown in FIG. 2 or 3, Park shows that the tongue retractor 130 has a wide portion and a narrower, concave portion 131 and then a wide cheek retractor at the end of the tongue retractor 130. *Id.* Thus, Park shows a main body that extends from a first end to a second end. *Id.*

The tongue retractor 130 is configured as a pocket defining an interior space. EX1006, ¶¶ 26-27; EX1003, ¶¶ 83-93. In fact, the tongue retractor 130 is a four-sided body with an anterior wall, a posterior wall, and two sidewalls that together

[3] Because Petitioner included the full claim language of the ’970 Patent in the Listing of Claims, Petitioner does not reproduce the full claim language here. The Board is encouraged to reference the Listing of Claims to see the full claim language, if necessary.

enclose an interior open space where suction occurs. EX1006, FIG. 2; EX1003, ¶¶ 83-92; *See also* Sections IX.A.1.c-d, g.





A PHOSITA would recognize Park as an enclosed mouthpiece with sidewalls from FIGs. 1-3 of Park. EX1003, ¶¶ 83, 93. FIG. 2 even illustrates the sidewalls extending into the insertion port 110, thereby clearly demonstrating their presence. EX1003, ¶ 93. Park illustrates a continuous sidewall around all edges of the tongue retractor 130, and that continuous edge extends onto the insertion port 110 and the tooth support section 120. *Id.* Thus, Park illustrates an isolation mouthpiece with sidewalls. EX1006, FIG. 2; EX1003, ¶ 93.

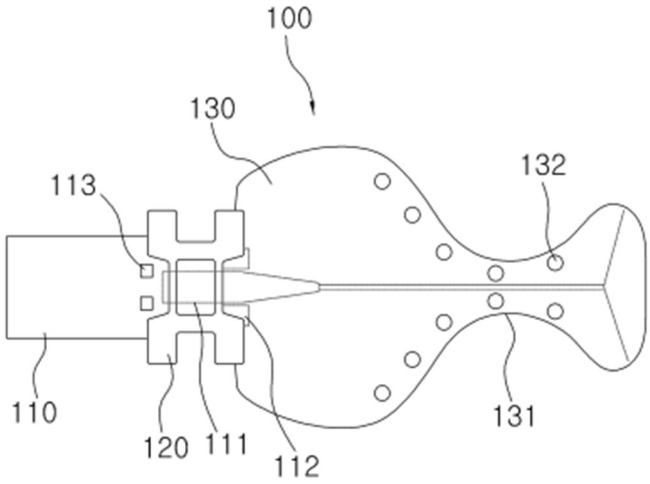
The specification further supports this conclusion. As shown in FIG. 3, the mouth prop 100 includes two suction ports 112 formed in the hollow insertion port 110 and extending into the tongue retractor 130. EX1006, FIG. 3, ¶¶ 27-28; EX1003, ¶¶ 89-91. Park teaches that the insertion port 110 is hollow and only *one* end of the insertion port 110 is open. EX1006, ¶ 27-28. Park further teaches that the insertion

port 110 has a central interior that includes a post fitting groove 111 and suction ports 112. *Id.* Because only one end of the insertion port 110 is open, Park teaches that the second end, where the suction ports 112 are formed (see EX1006, FIG. 2), is enclosed and extends into an interior space of the tongue retractor 130. EX1006, ¶ 26-31. Indeed, Park specifically teaches that the tongue retractor 130 extends from the insertion port 110. EX1006, ¶ 26.

The suction ports 112 only extend partially into the tongue retractor 130, and the suction ports 112 do not extend to the through-holes 132 as a dedicated channel. EX1006, ¶ 26-31, FIG. 3; EX1003, ¶ 88. Additionally, Park fails to teach that any suction can occur through the sides of the mouth prop 100. EX1003, ¶ 91. Thus, a PHOSITA would understand that Park's mouth prop 100 has an interior open space that fluidly connects the holes 132 to the suction ports 112. EX1006, ¶¶ 30-31, FIG. 2; EX1003, ¶ 92. If the mouth prop 100 did not include an interior open space formed in the tongue retractor 130, then the holes 132 would serve no purpose, and the suction ports 112 would aspirate nothing. EX1003, ¶ 87. The existence of an interior chamber of the mouth prop is necessary to fluidly connect the suction ports 112 and the holes 132; otherwise Park would be inoperable to perform "suction of foreign substances in the oral cavity." EX1006, ¶ 10.

Finally, Park depicts the suction ports 112 (and the socket 111) using a line of a lighter shade than the edges of the tongue retractor 130. EX1006, FIG. 3; EX1003,

¶ 90. This is likely because the suction ports are only partially visible through clear silicone, but indicating that they extend into an internal chamber of the tongue retractor 130. EX1006, ¶32. These differences in shading are clearer on a computer screen than a printed copy. EX1003, ¶ 90.



Indeed, a PHOSITA would know that a mouth prop having through holes 132 that do not fluidly connect to the suction ports 112 would allow debris and fluid to pass through the through holes 132 and down a patient's throat, something a PHOSITA would know to avoid. EX1019, 4:16-21; EX1003, ¶ 87. If the suction connector 112 was not fluidly connected to the holes 132 through the tongue retractor 130 of the mouth prop 100, the suction port 112 would serve no purpose or be extremely ineffective, and a patient might choke or experience severe discomfort by the debris, fluid, etc. passing through the holes 132 during a dental procedure. EX1003, ¶¶ 87-88.

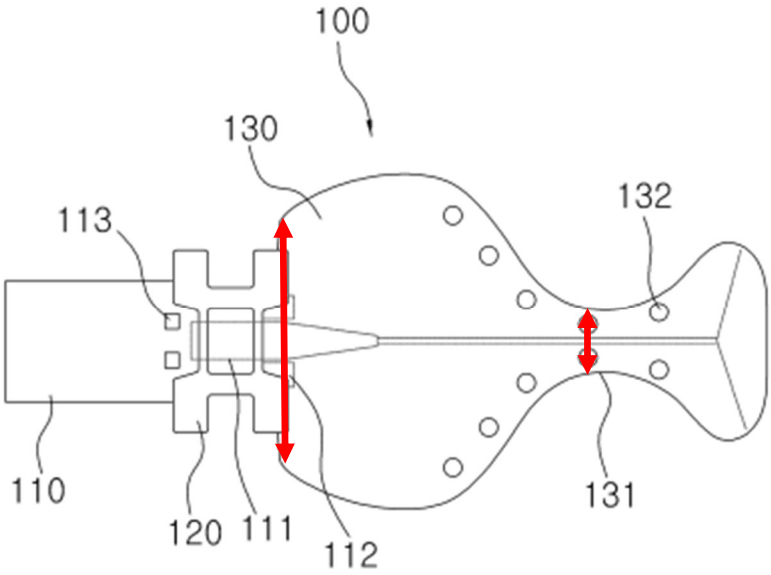
Moreover, a PHOSITA would know that a dentist would position the mouth prop 100 in a patient's mouth such that the concave area 131 would wrap behind teeth on the side of the mouth where a dentist would operate. EX1006, ¶ 47, 31. FIG. 6; EX1003, ¶¶ 85-86; EX1016, 2:13-20, FIG. 2. This is because the whale tale end, opposite the suction connector 112, retracts the patient's cheek near a dental operation. EX1006, ¶ 31. If the through-holes 132 were not fluidly connected to the suction ports 112 through the tongue retractor 130, then the suction ports 112 of the mouth prop 100 of Park would be positioned at the furthest possible location in the mouth from the dental operation. EX1003, ¶ 87-88. A PHOSITA would know that suction should occur as close as possible to the operating area to maximize capture of debris, fluids, and aerosols. *Id*. The farther away suction is positioned from generated fluid, debris, blood, etc., the less powerful it becomes; meaning the suction would not effectively aspirate unwanted fluids and debris in the mouth. *Id.* In other words, a PHOSITA would understand that the mouth prop of Park fluidly connects the suction ports 112 to the holes 132 through an inner chamber of the tongue retractor 130 to guide and channel the suction applied through the suction ports. EX1003, ¶ 88. A PHOSITA would understand that the only logical reason a mouth prop configured to expel debris and fluid (EX1006, ¶ 28, 9) would include through holes 132 is to ensure that suction occurs through the holes 132 via a fluid connection with the suction ports 112, especially considering the holes 132 align with the

location where a dental operation occurs. EX1003, ¶ 92. The only way the holes 132 would have an efficient fluid connection with the suction ports 112 is if the mouth prop 100 included an inner chamber through the mouth prop. *Id*. Thus, Park, at worst, implicitly teaches a four-sided mouth prop formed as a pocket with an inner chamber formed between the four walls. *Id*.

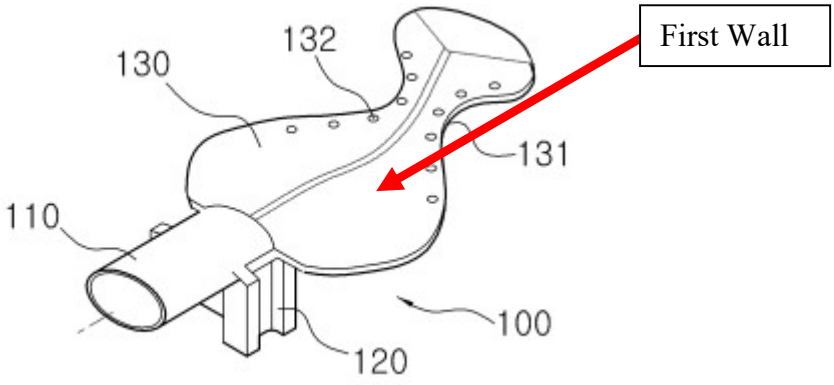
Thus, Park teaches a tongue retractor 130 configured as a pocket extending from the insertion port 110 to the cheek retractor near the concave portion 131 and enclosing an interior open space formed in the tongue retractor 130 between the suction ports 112 and the holes 132. *Id*.

c. **Limitation 1(c)**

As shown in FIG. 3, the tongue retractor 130 of Park has a first end that is narrower than the second end. EX1006, FIG. 3 (annotated). EX1003, ¶ 96.

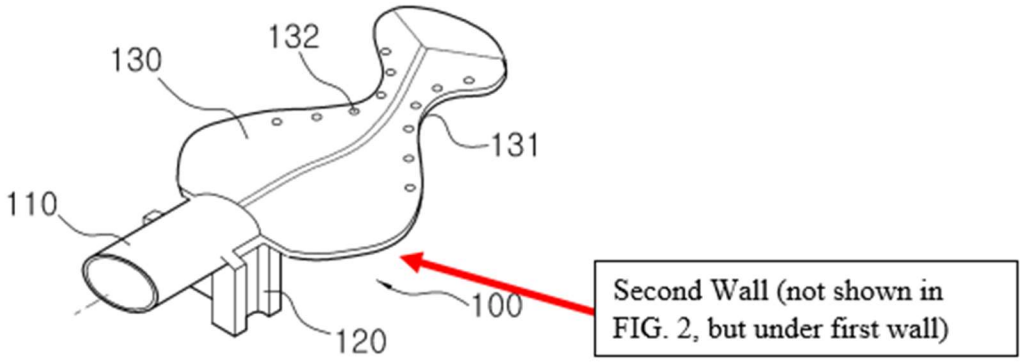


The tongue retractor 130 of Park has a first wall extending from the insertion port 110 to the cheek retractor near the concave portion 131. EX1006, FIG. 2; EX1003, ¶¶ 94-95.



d. **Limitation 1(d)**

The tongue retractor 130 of Park has a second wall that is exactly the same shape as the first wall. EX1006, FIG. 2-3; EX1003, ¶ 97. Thus, as shown in FIG. 3, the tongue retractor 130 of Park has a first end that is narrower than the second end.



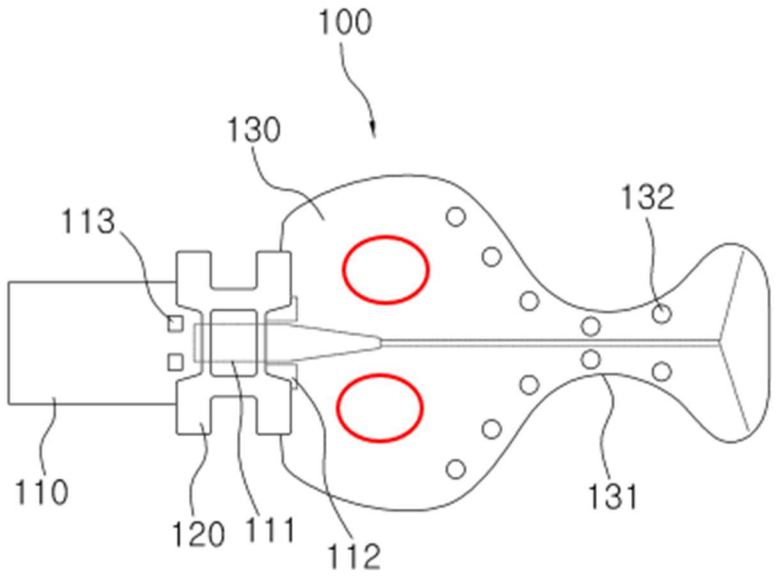
The second wall is spaced at a distance to the first wall because Park has an interior chamber and because of the existence of the sidewalls. *See* Section IX.A.1.b; EX1003, ¶¶ 98-99.

e. **Limitation 1(e)**

Park is silent regarding whether any structures are formed inside the interior chamber of the main body, which may be intentional as Park mentions that "common features," such as anti-collapse structures, are "omitted." EX1006, ¶ 22; EX1003, ¶ 100. However, a PHOSITA would understand that when suction is applied through the suction port 112, the first wall and the second wall are likely to collapse under the suction force. EX1007, 3:46-48; EX1003, ¶¶ 101-102. This collapsing would occur because Park teaches that the mouth prop comprises a flexible material, such as silicone. EX1006, ¶32, 34. The sidewalls and the insertion port 110 would help

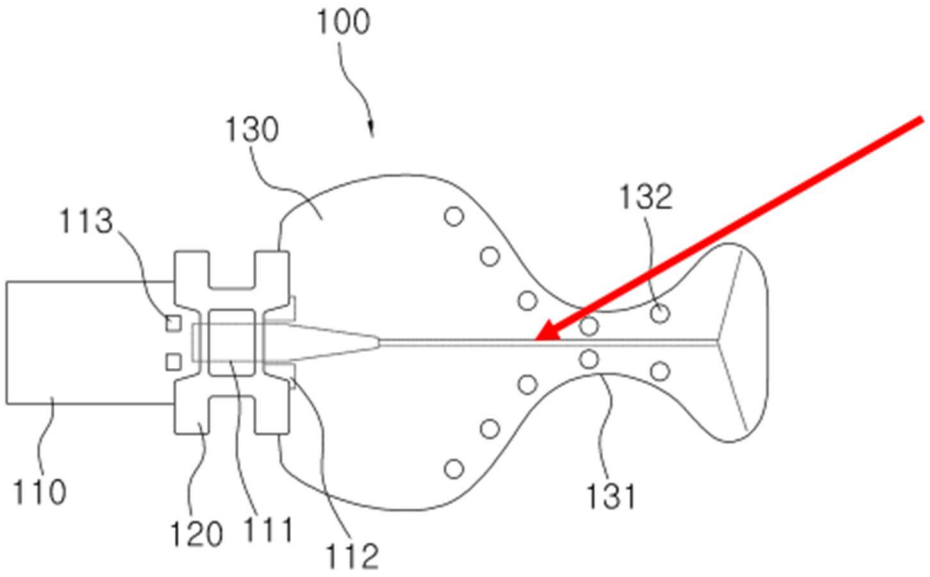
resist this collapsing force, but a PHOSITA would understand that additional anti-collapsing structure would assist at the weakest areas of the tongue retractor 130. EX1003, ¶¶ 102-104.

More specifically, an area of the mouth prop furthest from a rigid structure, such as the sidewall, the socket 111, or the insertion port 110 would be most likely to collapse under suction. EX1003, ¶ 102. A PHOSITA would understand that these areas, depicted below, are the most likely areas to collapse under suction due to their location and distance from rigid structure. *Id*.

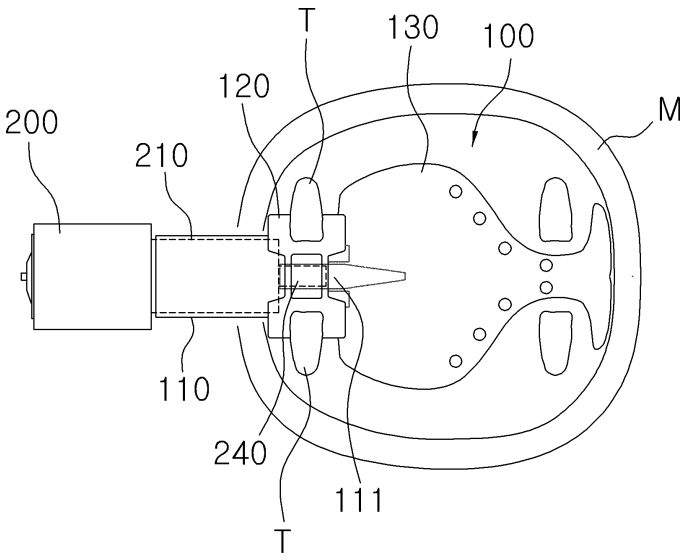


If these areas collapse under suction, suction power would be significantly reduced or blocked entirely. EX1003, ¶ 104. Thus, a PHOSITA would have been motivated to add anti-collapsing structure to prevent collapse. *Id*.

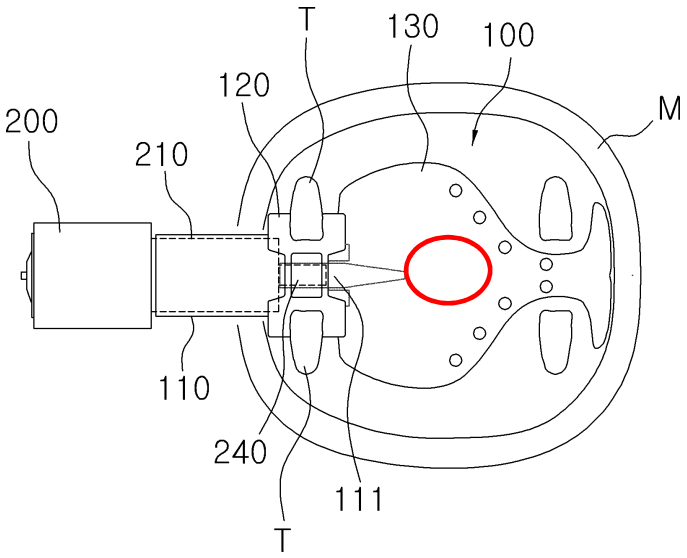
Moreover, it is unclear whether the mouth prop 100 includes a spine or other rigid structure running through the middle of the mouth prop 100. EX1003, ¶ 100. FIG. 3 of Park suggest that something is running from the socket 111 toward the cheek retractor end of the mouth prop. EX1006, FIG. 3.



However, this line is not shown in FIG. 6.



Thus, 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. EX1006, ¶ 39; EX1003, ¶ 100, 103. Thus, the weakest part of the mouth prop may actually be the exact center of the mouth prop (see annotated FIG. 6 below).



Regardless, a PHOSITA would know that Park is weak in at least one area and may collapse or restrict fluid communication due to wall collapse caused by suction due to the flexible material comprising the mouth prop 100. EX1006, ¶ 32; EX1003, ¶ 104. To prevent collapse or restriction, a PHOSITA would have been motivated to add mechanical elements that prevent collapse under suction. EX1003, ¶ 104; EX1007, 3:46-48.

Baughan teaches such a mechanical element that prevents collapse under suction. EX1007, 3:43-48. Specifically, Baughan teaches three projecting discs 17 that prevent collapse under suction when a sleeve is inserted over a tube 15. EX1007,

2:19-25, 2:51-55, 3:43-48. The discs 17 project outward from the tube, span the distance between the tube and the sleeve, and engage the sleeve. *Id.* These rigid structures, spaced apart from each other, prevent the sleeve from collapsing under suction. *Id.* Baughan teaches that the projecting discs 17 are secured to the tube 15 but the discs 17 are not attached to the sleeve 24, as they merely contact the sleeve or the sleeve rests upon the discs. EX1007, 2:19-25, 2:51-62; EX1003, ¶ 105. Thus, Baughan teaches projecting discs connected to and protruding from one structure (the tube 15) but not attached to another structure (the sleeve 24).

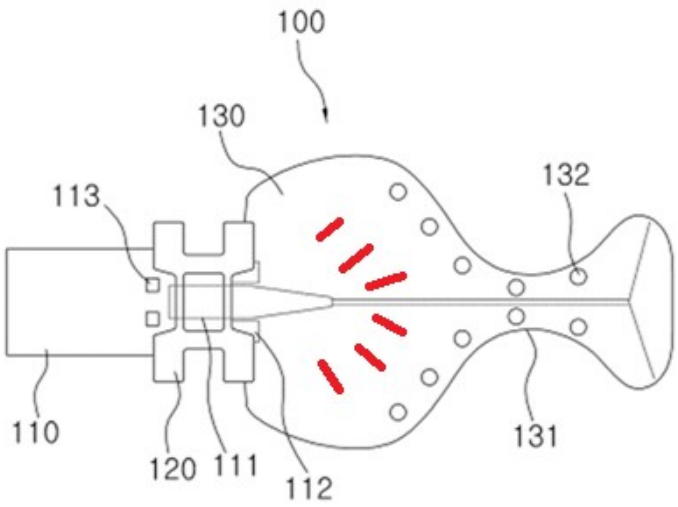
While Baughan teaches outward projecting discs, a PHOSITA using basic common sense, would modify the discs 17 for a tube-shaped embodiment to be projections for a flatter, non-tube embodiment. EX1003, ¶ 106; EX1008, FIG. 3. Indeed, it was well known in the art how to make projections on a flat surface. EX1008, FIG. 3, 4:16-23; EX1003, ¶¶ 106-107. Johnson further teaches that the projections are molded projections, which means the projections are integral with an interior surface on which they were formed. *Id.* Even so, making something integral is an obvious design choice. MPEP 2144.04(V)(B).

Applying the simple teachings of Baughan and Johnson to Park, it would have been obvious to include a plurality of spaced-apart projections formed on the posterior wall of Park to prevent collapsing of the posterior and anterior walls under suction at weak points of the mouth prop. EX1003, ¶ 108. A PHOSITA would have

expected success because these simple mechanical structures ensure separation between two walls that would otherwise collapse under suction. EX1007, 3:43-48; EX1003, ¶ 109. Moreover, Black taught this same concept but with an "open" mouthpiece lacking sidewalls. EX1005, 14:21-47. Park opted for sidewalls, but the concept of using perpendicularly projecting structures to prevent collapse of parallel walls under suction was demonstrated by Black and by Baughan. EX1005, 5:45-59; EX1007, 3:43-48. Thus, a PHOSITA would have expected success in using spaced-apart projections to prevent walls from collapsing under suction. EX1003, ¶ 109. A PHOSITA would have further known that spaced-apart projections ensure that channels for sucking saliva and foreign substances remain between the spaced-apart projections, lest the purpose of Park's mouth prop be defeated. EX1003, ¶ 109; EX1007, 3:36-48; EX1005, Abstract. Modifying Park in view of Baughan and/or Johnson would involve nothing more than applying a known technique (anti-collapse structure) to a known device ready for improvement (the mouth prop 100 of Park) to yield predictable results (preventing collapse at weak parts of the mouth prop 100 under suction), or combining prior art elements (a mouth prop having an interior chamber) according to known methods (using spaced-apart projections to prevent collapse under suction) to yield predictable results (the projections would prevent collapse under suction and still allow for suction channels therebetween). EX1003, ¶ 109.

The spaced-apart projections taught by Baughan could be formed on either the first wall or the second wall. A PHOSITA would know that it makes no difference which wall connects to the projections so long as the projections connect to one of the walls. EX1003, ¶ 110; EX1007, FIG. 3

Park in view of Baughan and Johnson would predictably result in multiple projections formed at the weakest point(s) of Park 111. *See* annotated EX1006, FIG. 3 below; EX1003, ¶ 108, 111.



A PHOSITA would know that the projections could be formed at any angle, but angling the projections/troughs toward the holes would create an efficient convergent flow. EX1005, 8:21-39; EX1003, ¶ 108.

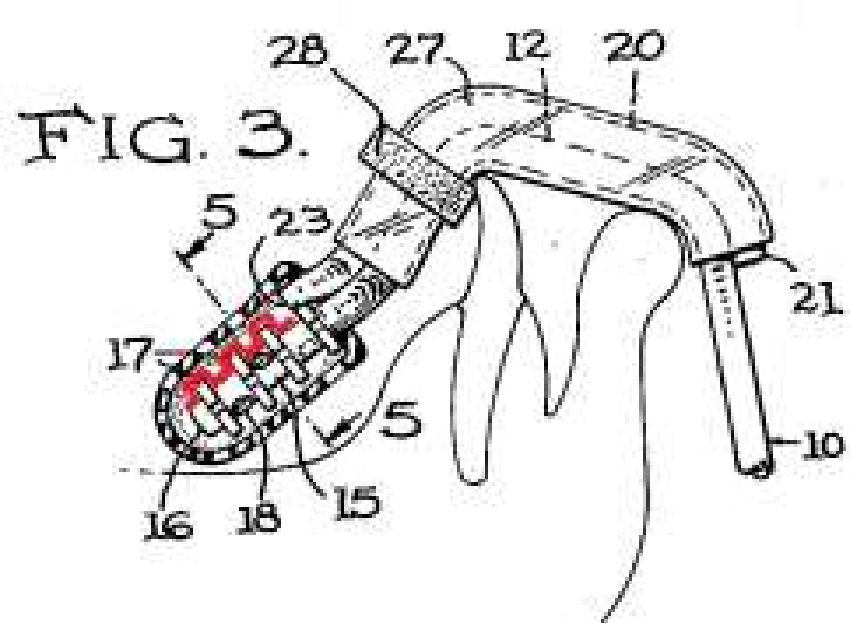
To the extent Patent Owner argues that the discs of Baughan are not "integral," it would have been obvious to integrally form projections in view of Park or Johnson.

EX1003, ¶ 106. Park teaches a silicone material that comprises the mouth prop 100. EX1006, ¶ 32. Adding integral projections would have been obvious in view of common knowledge in injection molding. EX1003, ¶ 106. Alternatively, it would have been obvious to add projections integrally in view of Johnson. Johnson teaches a plurality of integrally formed projections formed on an inner surface of a dental apparatus. EX1008, 4:16-23; MPEP 2144.04(V)(B).

Thus, Park in view of Baughan and Johnson teaches limitation 1(g). EX1003, ¶ 111.

f. **Limitation 1(f)**

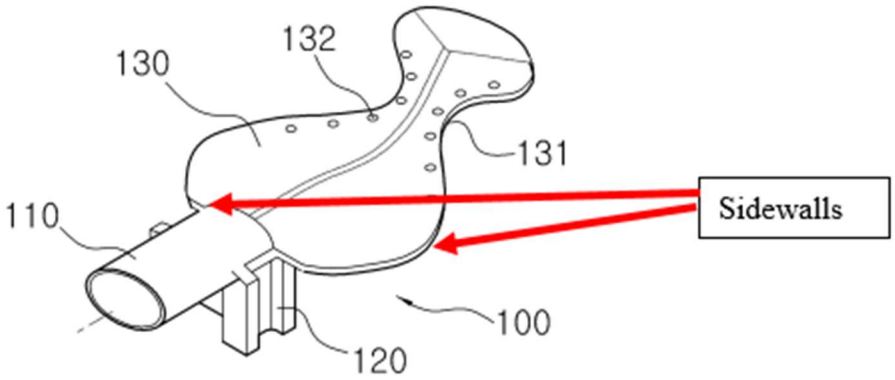
Baughan teaches that the spaced-apart discs result in a square wave shape having crests and troughs. EX1007, FIG. 3 (annotated below); EX1003, ¶ 112.



In fact, each individual disc 17 is formed in a wave shape with notches 19 formed in each disc so that saliva "will always be able to pass through." EX1007, 3:40-43. In fact, the notches 19 formed in each disc are described in the same way as the bridge structure of the '970 Patent. EX1007, 3:40-43.; EX1001, 4:61-65. As shown below, the notches 19 in the disc also form a square wave shape. EX1007, FIG. 5 (annotated); EX1003, ¶¶ 65-66.

g. **Limitation 1(g)**

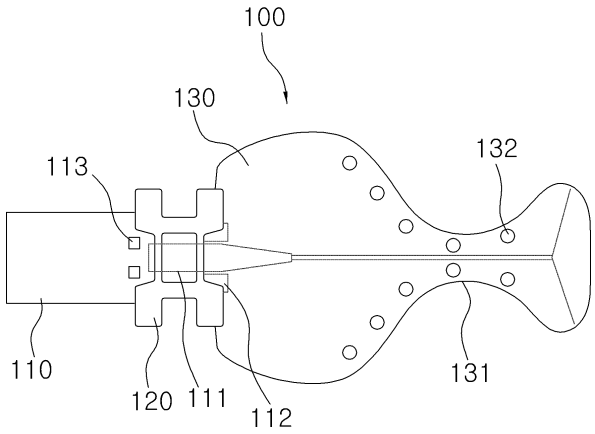
The tongue retractor 130 of Park has a sidewall connecting the anterior wall and the posterior wall. EX1006, FIG. 2; EX1003, ¶ 113.



h. **Limitation 1(h)**

Park teaches an insertion port 110 that suctions foreign materials and connects to a vacuum source. EX1006 ¶¶ 26-28, 43; EX1003, ¶ 114. The insertion port 110 suctions through the suction ports 112 and through the holes 132 via the inner chamber, and the suction ports 112 connect the inner chamber to the insertion port. *Id.*; *See* Section IX.A.1.b. Park discloses the insertion port 110 as hollow, thus teaching a suction connector that includes a cavity extending longitudinally from the main body portion and in communication with the interior chamber of the tongue retractor 130. EX1006 ¶¶ 26-28; EX1003, ¶ 116-117. Park shows this hollow insertion port as having a cavity extending from the opening to the suction ports 112. EX1006, FIG. 2-3.

Park shows that the insertion port 110 extends from a first end of the mouth prop 100. EX1006, FIG. 3.

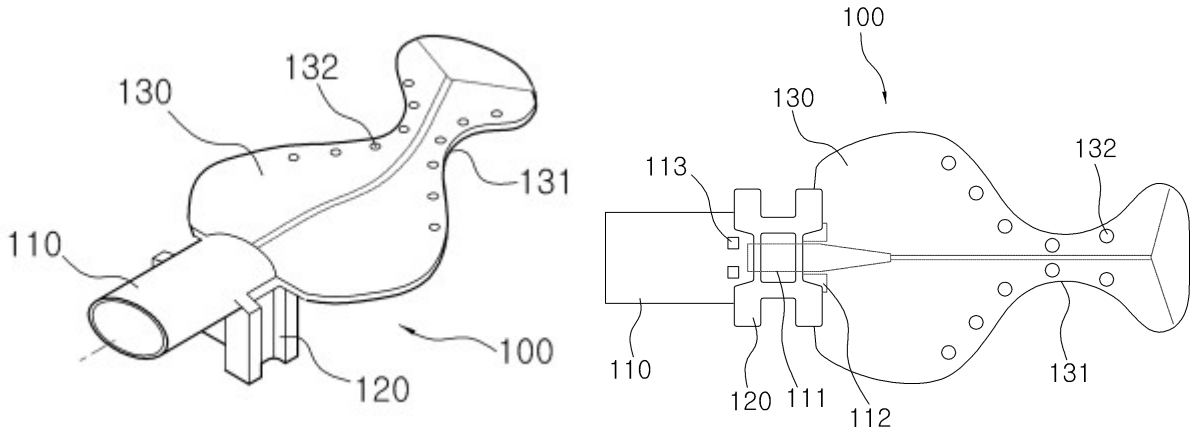


Park further teaches that the mouth prop 100 is formed of one piece. EX1006, ¶ 32; EX1003, ¶ 115. Thus, the insertion port 110 is integral with the tongue retractor. *Id.*; MPEP 2144.04(V)(B).

a. **Limitation 1(i)**

Park teaches a tooth support section 120, which is a mouth prop, formed into one piece with the rest of the mouth prop 100. EX1005, ¶ 29, 32, 54, Abstract, FIG. 1-3.

As shown in FIG. 2-3, the insertion port 110 extends through and past the tooth support section 120. EX1003, ¶¶ 118-119.



Therefore, claim 1 of the ’970 Patent is obvious in view of Park, Baughan, and Johnson. EX1003, ¶ 120.

2. **Claim 9**

Park teaches a projection hole (cutout) 113 that receives a locking projection 211 formed on the adapter 200, thereby teaching an interlocking fit. EX1005, ¶ 35; EX1003, ¶ 121. Park teaches that these corresponding features prevent the mouth

prop 100 from easily coming off the adapter 200. *Id.* Park shows that the projection hole (cutout) 113 is formed on the insertion port 110. EX1006, FIG. 3.

3. **Claim 10**

Park teaches an insertion port 110 that suctions foreign materials and connects to a vacuum source. EX1006 ¶¶ 26-28; EX1003, ¶ 122. The insertion port 110 suctions through the suction ports 112 and through the holes 132 via the inner chamber. *Id.*; *See* Section IX.A.1.h.

4. **Claim 11**

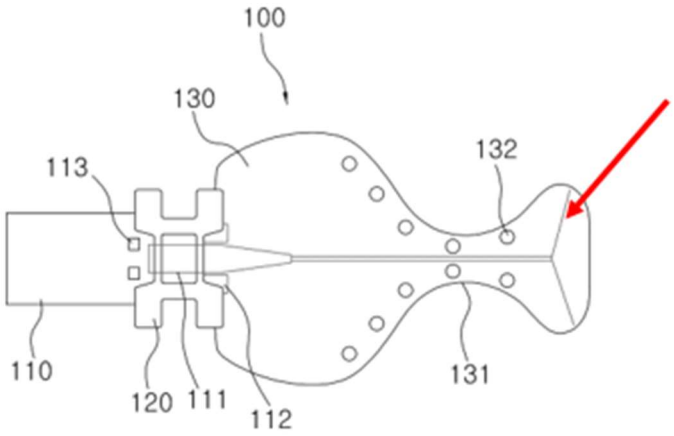
Park shows that the holes 132 are placed on both the front wall and the back wall. EX1005, ¶ 31, FIG. 2-3; EX1003, ¶ 123.

5. **Claim 12**

Park teaches an insertion port 110 that suctions foreign materials and connects to a vacuum source. EX1006 ¶¶ 26-28, 42-43; EX1003, ¶ 124. The insertion port 110 suctions through the suction ports 112 and through the holes 132 via the inner chamber. *Id.*; *See* Section IX.A.1.h.

6. **Claim 13**

Park teaches that the cheek retractor portion keeps tissue away from an area of work when bent. EX1005, ¶ 31.



Park further teaches that the mouth prop comprises a flexible material. EX1005, ¶ 32. Thus, Park teaches that the cheek retractor's pressure is based on the mouth prop material's (silicone) resilience. EX1003, ¶ 125.

7. **Claim 15**

Park teaches a mouth prop formed as one piece. EX1006, ¶ 32; EX1003, ¶ 126. A PHOSITA would know that forming silicone is commonly performed using injection molding. EX1003, ¶¶ 127; EX1008, 5:20-22 (teaching that plastic can be formed using injection molding).

8. **Claim 16**

Park teaches a mouth prop formed of silicone that is reusable after sterilization. EX1006, ¶ 32, Abstract. Park further teaches the mouth prop 100 as transparent. EX1006, ¶ 49; EX1003, ¶ 128.

9. **Independent Claim 18**

a. **Limitation 18(a)**

See Section IX.A.1.a; EX1003, ¶ 129.

b. **Limitation 18(b)**

See Section IX.A.1.b; EX1003, ¶ 130.

c. **Limitation 18(c)**

See Section IX.A.1.b. and Section IX.A.1.c. Park has an interior chamber, and thus, has an interior surface on both the first and second walls. EX1003, ¶¶ 131-132.

d. **Limitation 18(d)**

See Section IX.A.1.b. and Section IX.A.1.d. Park has an interior chamber, and thus, has an interior surface on both the first and second walls. EX1003, ¶¶ 133-134.

e. **Limitation 18(e)**

See Section IX.A.1.e-f; EX1003, ¶ 135.

f. **Limitation 18(f)**

See Section IX.B.1.g; EX1003, ¶ 136.

g. **Limitation 18(g)**

See Section IX.A.1.i; EX1003, ¶ 137.

h. **Limitation 18(h)**

See Section IX.B.1.h; EX1003, ¶ 138.

Therefore, claim 18 of the ’970 Patent is obvious in view of Park, Baughan, and Johnson. EX1003, ¶ 139-140.

B. Ground 2: Claims 2-4, 7-8, and 17 are obvious under 35 U.S.C. § 103 by Park in view of Baughan, Johnson, and Black

1. Claim 2

Black teaches a removable bite block. EX1005, 2:1-7, 15:36-51. The bite member 310, which is removable, includes a circular conduit 312 for receiving a neck 346 of Black's tongue shield aspirator 340. EX1005, 12:10-26, 15:36-51, FIGs. 19 and 20B; EX1003, ¶ 141. The bite member 310 is a "bite block portion" as claimed, and the circular conduit 312 is a "strap" as claimed. *Id.*

Exactly as recited in claim 2, the circular conduit 312 corresponds to the circumference of the neck 346 because the tubular neck 346 fits into the circular conduit, and that form an interlocking fit. EX1005, 12:10-26, FIGs. 19 and 20B; EX1003, ¶ 141. For the same reasons, the cross section of the circular conduit 312 is parallel to the cross section of an opening of the neck 346 and the conduit through the neck 346. *Id*.

Further still, Black teaches that the circular conduit 312 includes a distal edge 312a and a proximal edge 312b (*i.e.,* opposite edges). EX1005, 12:10-26, FIG. 18; EX1003, ¶ 142. Once the neck is inserted into the circular conduit, the distal edge 312a and proximal edge 312b are adjacent to the surface of the neck 346. *Id.* As shown in FIG. 18, the edges touch the external surface of the neck 346, which passes through the circular conduit of the bite member 310. Finally, Black teaches that the bite block 310 and the circular conduit are molded as one piece. EX1005, 12:27-36;

EX1003, ¶ 143. Use of injection molding is an obvious manufacturing choice. EX1003, ¶ 127.

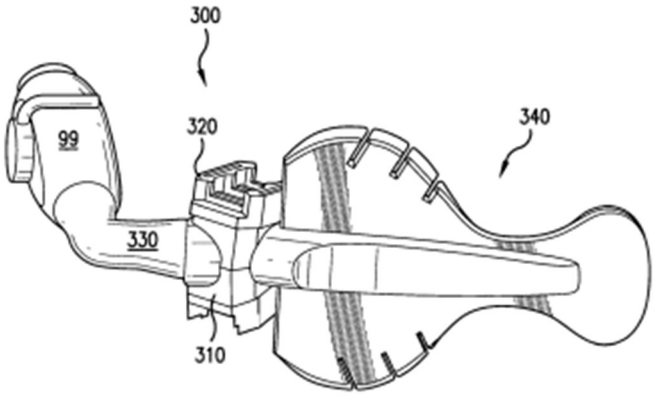


FIG. 18

It would have been obvious to make the tooth support section 120 of Park removable in view of Black. EX1003, ¶ 144. Black explains that bite members can come in different sizes for different patients. EX1005, 9:36-38, 10:15-17. A PHOSITA would know that not all mouths are the same size, and the ratio between jaw size and intraoral cavity size is not always a constant ratio. EX1003, ¶ 144. Thus, a PHOSITA would be motivated to make the tooth support section 120 of Park removable in view of Black to accommodate different sized mouths. *Id.* Black shows all the necessary structure to render a bite block removable, and therefore a PHOSITA would have expected success in making Park's tooth support section removable. *Id.*

2. **Claim 3**

Black teaches that the bite member is elastic. EX1005, 9:36-49; EX1003, ¶ 145.

3. **Claim 4**

Black teaches that the neck 346 of the tongue aspirator 340 includes a longitudinal projection 344. EX1005, 15:36-51; EX1003, ¶ 146. As shown, in FIGs. 23B-C, the projection 344 separates an external surface of the neck 346 into a first surface and a second surface, and the top surface of the projection 344 is an interior surface. Moreover, the projection is formed with sidewalls on each side.

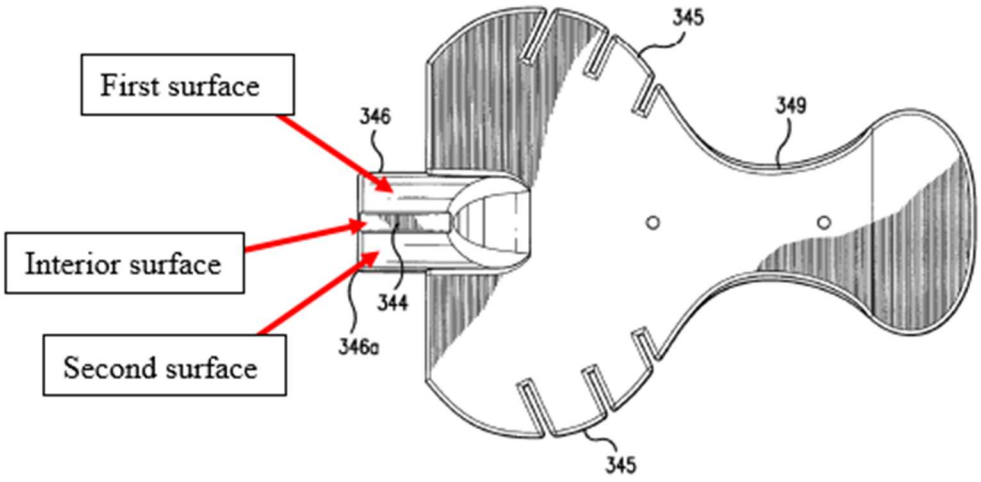


FIG.23B

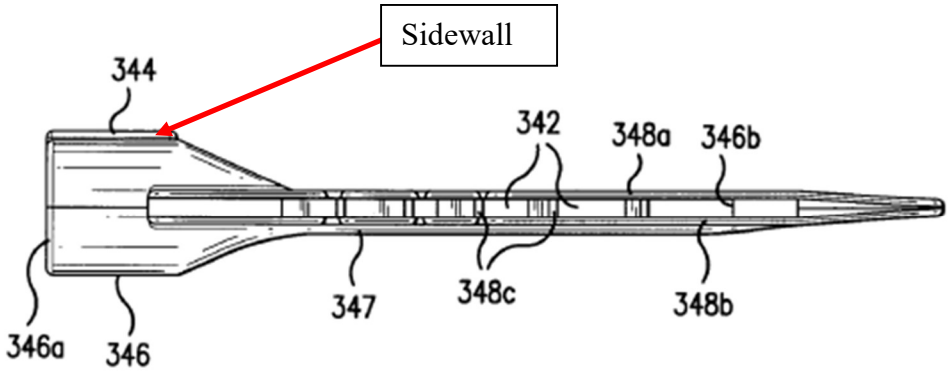


FIG.23C

The second sidewall is not shown in FIG. 23C, but would be visible from the other side perspective.

To the extent Patent Owner argues that the projection 344 cannot be a "notch", these concepts are two sides of the same coin. EX1003, ¶ 147. A notch projects in, whereas a projection projects out. *Id.* This is a basic reversal of parts, which is within the ordinary skill of a PHOSITA. EX1003, ¶ 147; MPEP 2144.04(VI)(A). Black included the projection 344 so that it can key with a corresponding groove. EX1005, 15:36-51. Black could have just as easily reversed those parts such that the groove was formed on the neck, and the projection was formed on the bite member, as that would be a simple reversal of parts. *Id.*

4. **Claim 7**

Black teaches a projection 344 fits into a groove 311 on the bite member 310. EX1005, 15:36-51; EX1003, ¶ 148.

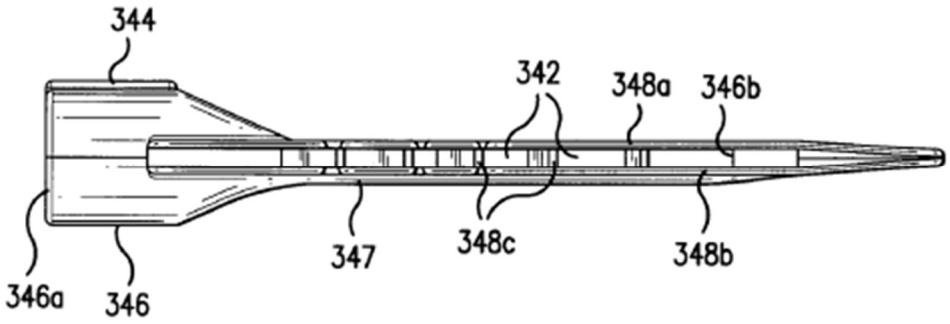


FIG.23C

5. **Claim 8**

Black teaches a projection 344 fits into a groove 311 on the bite member 310. EX1005, 15:36-51; EX1003, ¶ 149. A PHOSITA would know that anytime a gap is filled by a solid member, compressibility would decrease due to the gap being filled by a solid object. EX1003, ¶ 149.

6. **Claim 17**

Black teaches that the bite member 310 may come in various sizes. EX1005, 9:36-38, 10:15-17; EX1003, ¶ 150. Black further teaches assembling all parts, including attaching a bite member. EX1005, 19:33-52. Thus, Black teaches that a first bite block may be swapped for a second bite block of a different size. EX1003, ¶ 150.

C. **Ground 3: Claim 14 is further obvious under 35 U.S.C. § 103 by Park in view of Baughan, Johnson, and Hirsch**

1. **Claim 14**

Park depicts a line running down the longitudinal axis of the mouth prop 100. EX1006, FIGs. 2-3. Park fails to expressly teach what this line is or how it functions. Park implies that this line likely assists in light transmission, especially considering that the light socket 111 is formed at one end of the line. EX1006, ¶ 39; EX1003, ¶ 151.

It was well known before the priority date of the '970 Patent to include a spine in a dental isolation mouthpiece. For example, Hirsch teaches a dental isolation mouthpiece with a spine 365 running down a longitudinal axis of the mouthpiece.

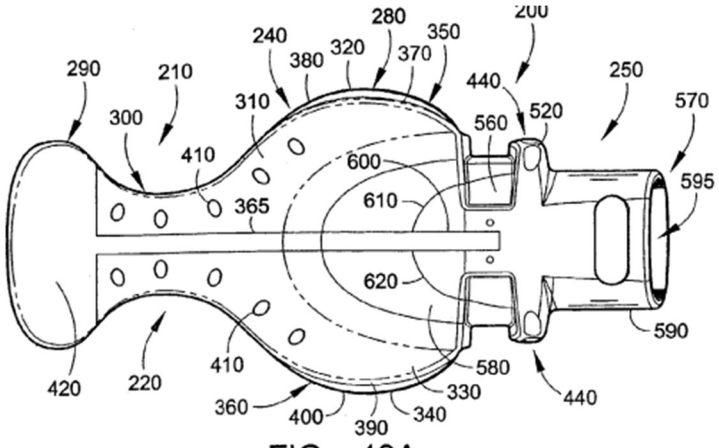


FIG. 19A

Hirsch teaches that the spine protrudes from an interior surface of the posterior wall and extends at least partially through the cheek retractor. EX1012, ¶ 78. Hirsch teaches that this spine 365 assists in dispersing light in the oral cavity – a goal that Hirsch and Park share. EX1006, Abstract; EX1012, ¶ 78. The additional benefit of the spine would be additional rigidity and resiliency, particularly where teeth engage the concave portion 131. EX1003, ¶¶ 152-154. Thus, a PHOSITA would have been

motivated to include the spine of Hirsch to the mouthpiece of Park to increase rigidity and help disperse light across the entire mouthpiece. *Id*. The increased rigidity would also help retract cheek tissue. EX1005, 7:21-39; EX1003, ¶ 154.

A PHOSITA would have expected success in adding the spine to the mouthpiece of Park, especially considering that both mouthpieces perform the same function and have very similar designs (Hirsch simply lacks sidewalls). EX1003, ¶ 154. Moreover, the addition of the spine would help prevent collapse of the top wall and bottom wall under suction. *Id*. The combination of the spine and the projections would prevent collapse at all weak areas of the mouth prop 100. *Id*. Finally, Park already envisioned two suction ports 112, so the addition of a dividing spine would not affect the ability to suction from all parts of the mouth prop 100. *Id*.

X. **CONCLUSION**

Petitioner has demonstrated in this Petition that claims 1-4 and 7-18 of the ’970 Patent are unpatentable. Petitioner, therefore, respectfully requests institution of an *inter partes* review of the ’970 Patent and that claims 1-4 and 7-18 be canceled.

Respectfully submitted,

Dated: May 28, 2025

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CERTIFICATION

The Petition excluding the caption, Table of Contents, Table of Exhibits, Mandatory Notices under 37 C.F.R. § 42.8, and this Certification contains 7,404 words.

Respectfully submitted,

Dated: May 28, 2025

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CERTIFICATE OF SERVICE

I hereby certify that on this the 28th day of May 2025, the foregoing Petition for *inter partes* review and all exhibits and other documents filed together with the Petition were served via Federal Express to the attorneys of record for the '970 Patent at the following address:

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