

Placeholder Sheet for Supplemental Content

Application Number: 18823885

Document Date: 09/04/2024

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ELECTRONIC PAYMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
09/04/2024 11:14:09 AM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 67018542

AUTHORIZED BY Ruby Chung

CUSTOMER # 138718

FILING DATE -

CORRESPONDENCE ADDRESS -

FIRST NAMED INVENTOR Thien Nguyen

Payment Information

PAYMENT METHOD
DA / 501662

PAYMENT TRANSACTION ID
E202494B15077538

PAYMENT AUTHORIZED BY
Heather Armstrong

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2830	PROCESSING FEE, EXCEPT IN PROVISIONAL APPLICATIONS	56.00	1	56.00
2817	REQUEST FOR PRIORITIZED EXAMINATION	1680.00	1	1680.00
2111	UTILITY PATENT APPL. SEARCH FEE	280.00	1	280.00
4011	BASIC FILING FEE- UTILITY	64.00	1	64.00
2311	EXAMINATION OF ORIGINAL PATENT APPLICATION	320.00	1	320.00
2202	EACH CLAIM IN EXCESS OF 20	40.00	8	320.00
TOTAL AMOUNT:				\$2,720.00

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH	
		Application Number		
Title of Invention	INTRAORAL DEVICE			
The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76. This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.				

Secrecy Order 37 CFR 5.2:

☐	Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)
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Inventor Information:

Inventor 1					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Thien		Nguyen		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Santa Ana	State/Province	CA	Country of Residenceⁱ	US
Mailing Address of Inventor:					
Address 1	50 Bearfoot Rd.				
Address 2					
City	Northborough		State/Province	MA	
Postal Code	01532		Countryⁱ	US	
Inventor 2					Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Tam Thanh		Pham		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	San Francisco	State/Province	CA	Country of Residenceⁱ	US
Mailing Address of Inventor:					
Address 1	50 Bearfoot Rd.				
Address 2					
City	Northborough		State/Province	MA	
Postal Code	01532		Countryⁱ	US	
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).
--

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH	
		Application Number		
Title of Invention	INTRAORAL DEVICE			

☐ An Address is being provided for the correspondence information of this application.

Customer Number	138718		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	INTRAORAL DEVICE		
Attorney Docket Number	INCEP-001COH	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	11	Suggested Figure for Publication (if any)	

Filing By Reference:

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	☒ Customer Number	☐ US Patent Practitioner	☐ Limited Recognition (37 CFR 11.9)
Customer Number	138718		

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, 365(c), or 386(c) or indicate National Stage entry from a PCT application. Providing benefit claim information in the Application Data Sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.

When referring to the current application, please leave the "Application Number" field blank.

Prior Application Status	Pending		Remove		
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
	Continuation of	18/679097	2024-05-30		
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
18/679097	Continuation of	18217304	2023-06-30	12011329	2024-06-18
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
18217304	Continuation of	14228057	2014-03-27	11744686	2023-09-05
Prior Application Status	Patented		Remove		
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)	Patent Number	Issue Date (YYYY-MM-DD)
14228057	Continuation of	14100323	2013-12-09	8911232	2014-12-16
Prior Application Status	Expired		Remove		
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)		
14100323	Claims benefit of provisional	61734939	2012-12-07		
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button. Add					

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55. When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX)ⁱ the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(i)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Application Number	Country ⁱ	Filing Date (YYYY-MM-DD)	Access Code ⁱ (if applicable)
			Remove

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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button.

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Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.

NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

Authorization or Opt-Out of Authorization to Permit Access:

When this Application Data Sheet is properly signed and filed with the application, applicant has provided written authority to permit a participating foreign intellectual property (IP) office access to the instant application-as-filed (see paragraph A in subsection 1 below) and the European Patent Office (EPO) access to any search results from the instant application (see paragraph B in subsection 1 below).

Should applicant choose not to provide an authorization identified in subsection 1 below, applicant **must opt-out** of the authorization by checking the corresponding box A or B or both in subsection 2 below.

NOTE: This section of the Application Data Sheet is **ONLY** reviewed and processed with the **INITIAL** filing of an application. After the initial filing of an application, an Application Data Sheet cannot be used to provide or rescind authorization for access by a foreign IP office(s). Instead, Form PTO/SB/39 or PTO/SB/69 must be used as appropriate.

1. Authorization to Permit Access by a Foreign Intellectual Property Office(s)

A. Priority Document Exchange (PDX) - Unless box A in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the State Intellectual Property Office of the People's Republic of China (SIPO), the World Intellectual Property Organization (WIPO), and any other foreign intellectual property office participating with the USPTO in a bilateral or multilateral priority document exchange agreement in which a foreign application claiming priority to the instant patent application is filed, access to: (1) the instant patent application-as-filed and its related bibliographic data, (2) any foreign or domestic application to which priority or benefit is claimed by the instant application and its related bibliographic data, and (3) the date of filing of this Authorization. See 37 CFR 1.14(h)(1).

B. Search Results from U.S. Application to EPO - Unless box B in subsection 2 (opt-out of authorization) is checked, the undersigned hereby **grants the USPTO authority** to provide the EPO access to the bibliographic data and search results from the instant patent application when a European patent application claiming priority to the instant patent application is filed. See 37 CFR 1.14(h)(2).

The applicant is reminded that the EPO's Rule 141(1) EPC (European Patent Convention) requires applicants to submit a copy of search results from the instant application without delay in a European patent application that claims priority to the instant application.

2. Opt-Out of Authorizations to Permit Access by a Foreign Intellectual Property Office(s)

☐ A. Applicant **DOES NOT** authorize the USPTO to permit a participating foreign IP office access to the instant application-as-filed. If this box is checked, the USPTO will not be providing a participating foreign IP office with any documents and information identified in subsection 1A above.

☐ B. Applicant **DOES NOT** authorize the USPTO to transmit to the EPO any search results from the instant patent application. If this box is checked, the USPTO will not be providing the EPO with search results from the instant application.

NOTE: Once the application has published or is otherwise publicly available, the USPTO may provide access to the application in accordance with 37 CFR 1.14.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.			
Applicant 1			Remove
If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.			
Clear			
☒ Assignee		☐ Legal Representative under 35 U.S.C. 117	
☐ Person to whom the inventor is obligated to assign.		☐ Joint Inventor	
☐ Person who shows sufficient proprietary interest			
If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:			
Name of the Deceased or Legally Incapacitated Inventor:			
If the Applicant is an Organization check here. ☒			
Organization Name	SOLMETEX, LLC		
Mailing Address Information For Applicant:			
Address 1	50 Bearfoot Rd.		
Address 2			
City	Northborough	State/Province	MA
Country	US	Postal Code	01532
Phone Number		Fax Number	
Email Address			
Additional Applicant Data may be generated within this form by selecting the Add button. Add			

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication. An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

[Remove](#)

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	Given Name	Middle Name	Family Name	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		State/Province	
Country ⁱ		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button.

[Add](#)**Signature:**[Remove](#)

NOTE: This Application Data Sheet must be signed in accordance with 37 CFR 1.33(b). However, if this Application Data Sheet is submitted with the **INITIAL** filing of the application and either box A or B is not checked in subsection 2 of the "Authorization or Opt-Out of Authorization to Permit Access" section, then this form must also be signed in accordance with 37 CFR 1.14(c).

This Application Data Sheet **must** be signed by a patent practitioner if one or more of the applicants is a **juristic entity** (e.g., corporation or association). If the applicant is two or more joint inventors, this form must be signed by a patent practitioner, **all** joint inventors who are the applicant, or one or more joint inventor-applicants who have been given power of attorney (e.g., see USPTO Form PTO/AIA/81) on behalf of **all** joint inventor-applicants.

See 37 CFR 1.4(d) for the manner of making signatures and certifications.

Signature	/Ruby Chung/		Date (YYYY-MM-DD)	2024-09-03	
First Name	Ruby	Last Name	Chung	Registration Number	76809

Additional Signature may be generated within this form by selecting the Add button.

[Add](#)

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	INCEP-001COH
		Application Number	
Title of Invention	INTRAORAL DEVICE		

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

- 1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.
- 2 A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
- 3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
- 4 A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
- 5 A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
- 6 A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
- 7 A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
- 8 A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
- 9 A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**CERTIFICATION AND REQUEST FOR PRIORITIZED EXAMINATION
UNDER 37 CFR 1.102(e) (Page 1 of 1)**

First Named Inventor:	Thien Nguyen	Nonprovisional Application Number (if known):	
Title of Invention:	INTRAORAL DEVICE		

APPLICANT HEREBY CERTIFIES THE FOLLOWING AND REQUESTS PRIORITIZED EXAMINATION FOR THE ABOVE-IDENTIFIED APPLICATION.

1. The processing fee set forth in 37 CFR 1.17(i)(1) and the prioritized examination fee set forth in 37 CFR 1.17(c) have been filed with the request. The publication fee requirement is met because that fee, set forth in 37 CFR 1.18(d), is currently \$0. The basic filing fee, search fee, and examination fee are filed with the request or have been already been paid. I understand that any required excess claims fees or application size fee must be paid for the application.
2. I understand that the application may not contain, or be amended to contain, more than four independent claims, more than thirty total claims, or any multiple dependent claims, and that any request for an extension of time will cause an outstanding Track I request to be dismissed.
3. The applicable box is checked below:

I. ☒ Original Application (Track One) - Prioritized Examination under § 1.102(e)(1)

i. (a) The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a). This certification and request is being filed with the utility application via USPTO patent electronic filing system.

---OR---

(b) The application is an original nonprovisional plant application filed under 35 U.S.C. 111(a). This certification and request is being filed with the plant application in paper.

ii. An executed inventor's oath or declaration under 37 CFR 1.63 or 37 CFR 1.64 for each inventor, or the application data sheet meeting the conditions specified in 37 CFR 1.53(f)(3)(i) is filed with the application.

II. ☐ Request for Continued Examination - Prioritized Examination under § 1.102(e)(2)

- i. A request for continued examination has been filed with, or prior to, this form.
- ii. If the application is a utility application, this certification and request is being filed via USPTO patent electronic filing system.
- iii. The application is an original nonprovisional utility application filed under 35 U.S.C. 111(a), or is a national stage entry under 35 U.S.C. 371.
- iv. This certification and request is being filed prior to the mailing of a first Office action responsive to the request for continued examination.
- v. No prior request for continued examination has been granted prioritized examination status under 37 CFR 1.102(e)(2).

Signature /Ruby Chung/	Date 2024-09-03
Name (Print/Typed) Ruby Chung	Practitioner Registration Number 76809

Note: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. Submit multiple forms if more than one signature is required.*

☒ *Total of 1 forms are submitted.

INTRAORAL DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation and claims the priority benefit of U.S. patent application 18/679,097 filed May 30, 2024, which is a continuation and claims the priority benefit of U.S. patent application 18/217,304 filed June 30, 2023, now U.S. patent 12,011,329, which is a continuation and claims the priority benefit of U.S. patent application 14/228,057 filed March 27, 2014, now U.S. patent 11,744,686, which is a continuation and claims the priority benefit of U.S. patent application 14/100,323 filed December 9, 2013, now U.S. patent 8,911,232, which claims the priority benefit of U.S. provisional patent application number 61/734,939 filed December 7, 2012, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention generally relates to the field of dental mouthpieces. More specifically, the present invention relates to intraoral dental suction and isolation mouthpieces.

2. Description of Related Art

[0003] Various mouthpieces are currently used by dental health professionals, dental hygienists, and dental assistants in the field of dentistry. In the past, a dental patient has been treated by a traditional two-person team that comprises a dental professional and a dental assistant. Further, dental treatment may be provided by the team using many different types of dental equipment and materials. Such dental equipment and materials may include such items as an intraoral mirror, a bite block, a slow speed suction ejector, a high speed suction ejector, gauzes, cotton rolls, and dry angles. Each item of dental equipment may be used for different purposes, though some may be used in combination for some types of dental services. As such, a dental professional seeking to provide such dental services may need to use multiple items of such dental equipment. An important role of the dental assistant is therefore to assist the dental professional in coordinating the use of these multiple items of different equipment and materials.

[0004] There is, therefore, 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.

SUMMARY OF THE CLAIMED INVENTION

[0005] Embodiments of the present invention may include 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0006] The main body portion may comprise an enclosed pocket made up of an anterior wall, a posterior wall, and a side wall in between the anterior and posterior walls. The side wall may be perforated with a plurality of perforations. Such perforations may constitute a mesh. Additional perforations may be located on the anterior and posterior walls. The main body portion may further include a slit along a longitudinal, central axis on the anterior wall. Such openings (*e.g.*, perforations and slit) allow for suction of air, fluids, and small debris from the patient's mouth, through the openings into the interior portion, and into the suction connector portion towards a suction source. Because the mouthpiece is made of a flexible and resilient material (*e.g.*, silicone), the mouthpiece may be bent when placed in a patient's mouth to conform to the shape of the mouth. When properly positioned, the suction connector portion may protrude from one side of the patient's mouth, while the main body lies against the back of the patient's mouth, and the cheek retractor presses against the patient's cheek on the opposite side of the patient's mouth.

[0007] The main body may further include an protruding bridge structure on the interior surface of the posterior wall. Such a 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. Meanwhile, the troughs provide gaps that allow for suction of air, fluids, and small debris through the bridge structure.

BRIEF DESCRIPTION OF THE FIGURES

- [0008] FIG. 1A is a perspective view of an exemplary mouthpiece with a detachable mouth prop.
- [0009] FIG. 1B is a top view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0010] FIG. 1C is a bottom view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0011] FIG. 1D is a side view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0012] FIG. 1E is a cross-sectional view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0013] FIG. 2A is a perspective view of the exemplary mouthpiece of FIG. 1A where the detachable mouth prop has been detached.
- [0014] FIG. 2B is a top view of the exemplary mouthpiece of FIG. 2A.
- [0015] FIG. 2C is a bottom view of the exemplary mouthpiece of FIG. 2A.
- [0016] FIG. 2D is a side view of the exemplary mouthpiece of FIG. 2A.
- [0017] FIG. 2E is a cross-sectional view of the exemplary mouthpiece of FIG. 2A.
- [0018] FIG. 3A is a front view of an exemplary mouth prop.
- [0019] FIG. 3B is a back view of the exemplary mouth prop of FIG. 3A.
- [0020] FIG. 3C is a bottom view of the exemplary mouth prop of FIG. 3A.
- [0021] FIG. 3D is a perspective view of the exemplary mouth prop of FIG. 3A .
- [0022] FIG. 3E is a side view of the exemplary mouth prop of FIG. 3A.
- [0023] FIG. 3F is a top view of the exemplary mouth prop of FIG. 3A.
- [0024] FIG. 4 is a close-up view of exemplary mesh sides in an exemplary mouthpiece.
- [0025] FIG. 5 is a close-up view of an internal bridge in an exemplary mouthpiece.
- [0026] FIG. 6A is a close-up view of an exemplary reinforcing bar in an exemplary mouthpiece.
- [0027] FIG. 6B is a cross-sectional view of the exemplary reinforcing bar of FIG. 6A.
- [0028] FIG. 7A is a close-up view of an exemplary cheek retractor portion in an exemplary mouthpiece.
- [0029] FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion of FIG. 7A.

DETAILED DESCRIPTION

[0030] Embodiments of the present invention provide for a mouthpiece comprising a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded as one-piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0031] FIGs. 1A-E are different views of an exemplary mouthpiece with an attachable mouth prop 160, while FIGs. 2A-E are different views of the exemplary mouthpiece of FIG. 1A where the attachable mouth prop 160 has been detached. Such a mouthpiece may include a main body portion 110, a suction connector portion 120, and a cheek retractor portion 130.

[0032] The main body portion 110 may include mesh or perforations 140, a stability bar 150, an open slit 170, and an internal bridge 180. The main body portion 110 may connect to a suction connector portion 120 on one end and a cheek retractor portion 130 at the other end. Such a cheek retractor portion 130 may be configured to press against and retract a patient's cheek away from the patient's teeth. When placed in a patient's mouth, the suction connector portion 120 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. The flexibility of the material used to form the mouthpiece allows for some bending when placed in the patient's mouth. The material is, however, resilient enough that the cheek retractor portion presses against the inside of the patient's cheek with such pressure being sufficient to move the cheek away from the patient's teeth.

[0033] An exemplary main body portion 110, when placed in a mouth, 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. The two walls may connect at a superior wall and an inferior wall forming a body that is at least partially enclosed.

Superior may be used herein to refer to the side that rests against a roof of a patient's mouth when placed therein, and inferior may be used to refer to the side that rests against the floor of the patient's mouth. The superior and inferior sides may be formed identically, which may allow for the mouthpiece to change orientation such that the superior side may appear as the inferior side

and vice versa, in the new orientation. When in use, the respective sides of the main body portion 110 may serve to protect and separate the top of the mouth and the bottom of the mouth/tongue. In addition, the main body portion 110 may also serve to protect the back of the mouth (*e.g.*, throat and airway) from falling debris.

[0034] Much of the main body portion 110 of the mouthpiece may be shaped as a straight-line arrowhead or shield whose base generally conforms to the intraoral shape of a patient's mouth. Differently-sized mouthpieces may be provided for differently-sized mouths of adults and children. Part of the base side of the arrowhead may be formed with thicker walls than the rest of the main body. Such thickening may provide additional stability.

[0035] In addition, the main body portion 110 of the mouthpiece may include a plurality of holes 140 distributed along the superior and inferior sides of the anterior and posterior walls to assist in suctioning of water, saliva and debris from the oral cavity. In some embodiments, a set of holes may also form a mesh along the walls of the superior and inferior edges. FIG. 4 is a close-up view of an exemplary mesh wall in an exemplary mouthpiece.

[0036] At the narrow end of the arrowhead that connects to the cheek retractor portion 130, the main body portion 110 may include a rectangular portion. Narrower than the base of the arrowhead, the rectangle may additionally include a reinforcing bar (or stability bar) 150 (described in further detail below) and may be at least partially crossed by a slit 170 (described in further detail below) into the interior of the pocket of the main body portion 110.

[0037] Stability bar 150 may be a protrusion or otherwise a thickened area that reinforces the stability of the rectangular portion and assist in shaping this region to the intraoral posterior shape of a patient's mouth. FIG. 6A is a close-up view of an exemplary stability bar 150 of an exemplary mouthpiece. FIG. 6B is a cross-sectional view of the exemplary reinforcing bar in the cheek retractor connector portion of FIG. 6A.

[0038] In some embodiments, the internal, rectangular-shaped reinforcing or stability bar 150 may be located distally to the internal wavelike bridge structure 180 and attached to both the interior side of the posterior surface of the main body and the rectangular portion. Such a stability bar 150 may be located in the area where a positioned mouthpiece begins to wrap from the lingual side of the most posterior mandibular tooth, around the distal side of the most posterior tooth, and to anterior side of the most posterior mandibular tooth, thereby assisting in shaping the mouthpiece to the general intraoral shape of a patient's mouth.

[0039] Various embodiments of the mouthpiece may further include a longitudinal, open slit 170 extending over approximately two-thirds of the main body on the anterior surface. Running

along the center of the main body across the rectangle and most of the arrowhead, such a slit 170 may assist in capture and suction of water, saliva and debris, as well as assisting in cleaning and maintenance.

[0040] Additionally, the main body of the mouthpiece may include a bridge structure 180 on an interior surface to ensure that the anterior and posterior surfaces remain separated during suction. FIG. 1E is a cross-sectional view of the mouthpiece in which the bridge structure 180 is illustrated. FIG. 5 is a close-up view of the bridge structure 180 without the surrounding walls of the main body portion. Such a bridge structure 180 may be formed as an 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. In some embodiments, the bridge structure 180 may be centrally-located in the main body portion 110 of the mouthpiece. 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. In some embodiments, the bridge structure 180 may follow the shape of a logo (*e.g.*, an arrowhead or shield).

[0041] The suction connector portion 120 may be oval-shaped and also attached to the main body portion 110. The suction connector portion 120 may be formed with thicker walls than the main body portion 110 and 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. The suction connector portion 120 may also include an internal stop to assist in sliding the mouthpiece onto the adapter to a desired depth. The suction connector portion 120 may additionally have an external, concave, notched region 210 that corresponds to a removable strap such that when the strap is in place, the external walls of the strap and the rest of the connector portion may be flush.

[0042] The cheek retractor portion 130 is illustrated as a hammerhead distal region, which may be attached to the main body portion 110. FIG. 7A is a close-up view of an exemplary cheek retractor portion 130 in an exemplary mouthpiece. FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion 130 of FIG. 7A.

[0043] The mouthpiece may be used with a mouth prop 160, as illustrated in FIGs. 1 (with a mouth prop 160) and FIGs. 2 (illustrated without the mouth prop 160). FIGs. 3A-E provide different close-up views of an exemplary mouth prop 160. The removable strap 310 may be attached to mouth prop 160, which may be used to prop open a patient's mouth and teeth. In this regard, the suction connector portion 120 may additionally have an external plug 220 (FIG. 2C) protruding from the posterior side of the suction connector portion 120. Such a plug 220 may

correspond to and serve to connect with an opening in the mouth prop 160. The mouth prop 160 may be reinforced by the presence of the plug 220 in the opening, thereby resulting in a more crush-resistant, nearly incompressible, and stable mouth prop 160. In some embodiments, the suction connector portion 120 may further have a cutout 230 (*e.g.*, which may be shaped as a logo) providing extra interlocking with a corresponding protrusion (*e.g.*, which may also be shaped as a logo) on an external high-suction vacuum adapter.

[0044] The mouth prop 160 may be made of thickened silicone material injection molded in a single piece with an elastic strap corresponding to the circumference of the suction connector portion. The mouth prop 160 has an internal, rectangular-shaped female slot designed to fit snugly with the external, rectangular-shaped male plug 220 of the suction connector portion 120 of the mouthpiece. Mouth props may be made in different sizes for differently sized mouths. Because the mouth prop and mouthpiece are detachable from each other, different sizes of each may be mixed and matched as needed for a particular patient's mouth.

[0045] The mouthpiece as described herein may be used with a one-piece, autoclavable, high-suction vacuum adapter. Such a high-suction vacuum body adapter may be made of a single homogenous material. Having a single lever design, such a vacuum adapter may function in the same manner as all the current high-suction vacuum evacuators and saliva ejectors in controlling the removal of water, saliva, and debris from the oral cavity to the outside vacuum source. The single lever may be designed to control the removal of water, saliva, and debris from the at least partially enclosed so main body through a single, large evacuation conduit within the suction connector portion.

[0046] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. The descriptions are not intended to limit the scope of the invention to the particular forms set forth herein. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above-described exemplary embodiments. It should be understood that the above description is illustrative and not restrictive. To the contrary, the present descriptions are intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims and otherwise appreciated by one of ordinary skill in the art. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the appended claims along with their full scope of equivalents.

CLAIMS

WHAT IS CLAIMED IS:

1. An isolation mouthpiece for use with a suction system in a dental procedure, the mouthpiece comprising:

a main body portion having a first end and a second end, the main body portion including:

a first wall having a first edge and a second edge extending from the first end of the main body portion towards the second end of the main body portion,

a second wall having a third edge and a fourth edge extending from the first end of the main body portion towards the second end of the main body portion, the second wall including a first plurality of perforations extending along a portion of the third edge, and a second plurality of perforations extending along a portion of the fourth edge, the second wall further including a wave-like structure having a plurality of crests extending toward the first wall and a plurality of troughs, each of the plurality of troughs providing a gap between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs; and wherein the first wall and the second wall are shaped such that the first edge of the first wall corresponds in shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall, and

a third wall connecting the first wall and the second wall such that the first wall is spaced from the second wall to define an inner cavity, wherein a portion of the first wall has a first width adjacent to the first end of the main body portion and a second width adjacent to the second end of the main body portion, wherein a portion of the second wall has a third width adjacent to the first end of the main body portion and a fourth width adjacent to the second end of the main body portion, wherein the first width is greater than the second width, and wherein the third width is greater than the fourth width;

a suction connector portion extending from the first end of the main body portion, the suction connector portion including:

a generally tubular conduit including an opening extending through the conduit and in fluid communication with the inner cavity, the opening being configured to receive a vacuum portion of the suction system therein, the generally tubular conduit further including a cutout configured to engage a protrusion on the suction system to aid in coupling the mouthpiece to the suction system, and

a mouth prop including a first side and a second side that are inwardly tapered from a top surface of the mouth prop towards a bottom surface of the mouth prop, the first side and the second side each including a plurality of ridges; and

a cheek retractor portion having a first cheek-retractor end coupled to the second end of the main body portion and a second cheek-retractor end, the first cheek-retractor end and the second cheek-retractor end each having rounded edges.

2. The mouthpiece of claim 1, wherein the first plurality of perforations includes at least five perforations and the second plurality of perforations include at least five perforations.

3. The mouthpiece of claim 2, wherein at least one of the first plurality of perforations and at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.

4. The mouthpiece of claim 1, wherein the first wall and the second wall of the main body portion transition into and are connected in the cheek retractor portion to form the cheek retractor portion, the first wall and the second wall of the main body portion that transition into the cheek retractor portion are spaced apart from each other for a distance within the cheek retractor portion before being connected to each other in the cheek retractor portion.

5. The mouthpiece of claim 4, wherein at least one of the first plurality of perforations and at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.
6. The mouthpiece of claim 1, wherein the cutout has a shield shape.
7. The mouthpiece of claim 1, wherein the cutout has a generally triangular shape.
8. The mouthpiece of claim 1, further including a stability bar located along a center of the first wall at least adjacent to the second end of the main body, at least one of the first plurality of perforations being positioned on one side of the stability bar and at least one of the second plurality of perforations being positioned on another side of the stability bar.
9. The mouthpiece of claim 8, wherein the stability bar extends upwardly from the first wall toward the second wall.
10. The mouthpiece of claim 9, wherein the stability bar does not contact the second wall.
11. An isolation mouthpiece for use with a suction system in a dental procedure, the mouthpiece comprising:
 - a main body portion having a first end and a second end, the main body portion including:
 - a first wall having a first edge and a second edge extending from the first end of the main body portion towards the second end of the main body portion,
 - a second wall having a third edge and a fourth edge extending from the first end of the main body portion towards the second end of the main body portion, the second wall including a first plurality of perforations extending along a portion of the third edge, and a second plurality of perforations extending along a portion of the fourth edge, wherein the second wall further including a wave-

like structure having a plurality of crests extending toward the first wall and a plurality of troughs, each of the plurality of troughs providing a gap between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs, and

a third wall connecting the first wall and the second wall such that the first wall is spaced from the second wall to define an inner cavity, wherein a portion of the first wall has a first width adjacent to the first end of the main body portion and a second width adjacent to the second end of the main body portion, wherein a portion of the second wall has a third width adjacent to the first end of the main body portion and a fourth width adjacent to the second end of the main body portion, wherein the first width is greater than the second width, and wherein the third width is greater than the fourth width;

a suction connector portion extending from the first end of the main body portion, the suction connector portion including:

a generally tubular conduit including an opening extending through the conduit and in fluid communication with the inner cavity, the opening being configured to receive a vacuum portion of the suction system therein, and

a mouth prop including a first side and a second side that are inwardly tapered from a top surface of the mouth prop towards a bottom surface of the mouth prop, the first side and the second side each including a plurality of ridges; and

a cheek retractor portion having a first cheek-retractor end coupled to the second end of the main body portion and a second cheek-retractor end, the first cheek-retractor end and the second cheek-retractor end each having rounded edges, wherein the first wall and the second wall of the main body portion that transition into the cheek retractor portion are spaced apart from each other for a distance within the cheek retractor portion before being connected to each other in the cheek retractor portion.

12. The mouthpiece of claim 11, wherein the generally tubular conduit includes a cutout configured to engage a protrusion on the suction system to aid in coupling the mouthpiece to the suction system.

13. The mouthpiece of claim 11, wherein the first plurality of perforations includes at least five perforations and the second plurality of perforations include at least five perforations.

14. The mouthpiece of claim 13, wherein the at least one of the first plurality of perforations and the at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.

15. The mouthpiece of claim 11, wherein the first wall and the second wall are shaped such that the first edge of the first wall corresponds in shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall.

16. The mouthpiece of claim 11, further including a stability bar located along a center of the first wall at least adjacent to the second end of the main body, at least one of the first plurality of perforations being positioned on one side of the stability bar and at least one of the second plurality of perforations being positioned on another side of the stability bar.

17. The mouthpiece of claim 16, wherein the stability bar extends upwardly from the first wall toward the second wall.

18. The mouthpiece of claim 17, wherein the stability bar does not contact the second wall.

19. The mouthpiece of claim 11, wherein a wall thickness within the suction connector portion is greater than a wall thickness of the first wall or the second wall of the main body.

20. A mouthpiece comprising:

a main body having a first end opposite a second end that is narrower than the first end, the main body comprising:

a first wall that extends from the first end to the second end, wherein the first wall includes a plurality of first edges,

a second wall that extends from the first end to the second end, wherein the first wall and the second wall define an interior space therebetween, and wherein the second wall includes:

a plurality of second edges,

a plurality of perforations that open into the interior space between the first wall and the second wall, and

a portion configured in a wave shape having one or more crests that extend towards and provide a plurality of contact points with the first wall and one or more troughs that provide a plurality of gaps through which fluids can pass between the contact points, wherein the portion is not attached to the first wall; and

a third wall that connects one of the first edges of the first wall to one of the second edges of the second wall; and

a cheek retractor portion extending from the second end and connected to the first wall and the second wall of the main body.

21. The mouthpiece of claim 20, further comprising a suction connector extending from the first end of the main body, wherein an evacuation conduit within the suction connector is in communication with the interior space between the first wall and the second wall.

22. The mouthpiece of claim 21, wherein the suction connector further includes a cutout configured to interlock with a corresponding protrusion of a vacuum adapter.
23. The mouthpiece of claim 20, further comprising a stability bar corresponding to a thickened area of the main body, the stability bar extending along a longitudinal axis of the main body between the first wall and the second wall, wherein a thickness of the stability bar reinforces at least a portion of the main body.
24. The mouthpiece of claim 20, wherein a material used to form the main body is a flexible, translucent, high heat-resistant, autoclavable silicone-based material.
25. The mouthpiece of claim 20, further comprising a mouth prop injection-molded in one piece.
26. The mouthpiece of claim 25, wherein the mouth prop is connected to a suction connector.
27. The mouthpiece of claim 26, wherein at least one of the cheek retractor and the suction connector is integral with the main body.
28. The mouthpiece of claim 20, wherein the perforations are distributed along one or more of the second edges of the second wall.

ABSTRACT

A dental mouthpiece is provided 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

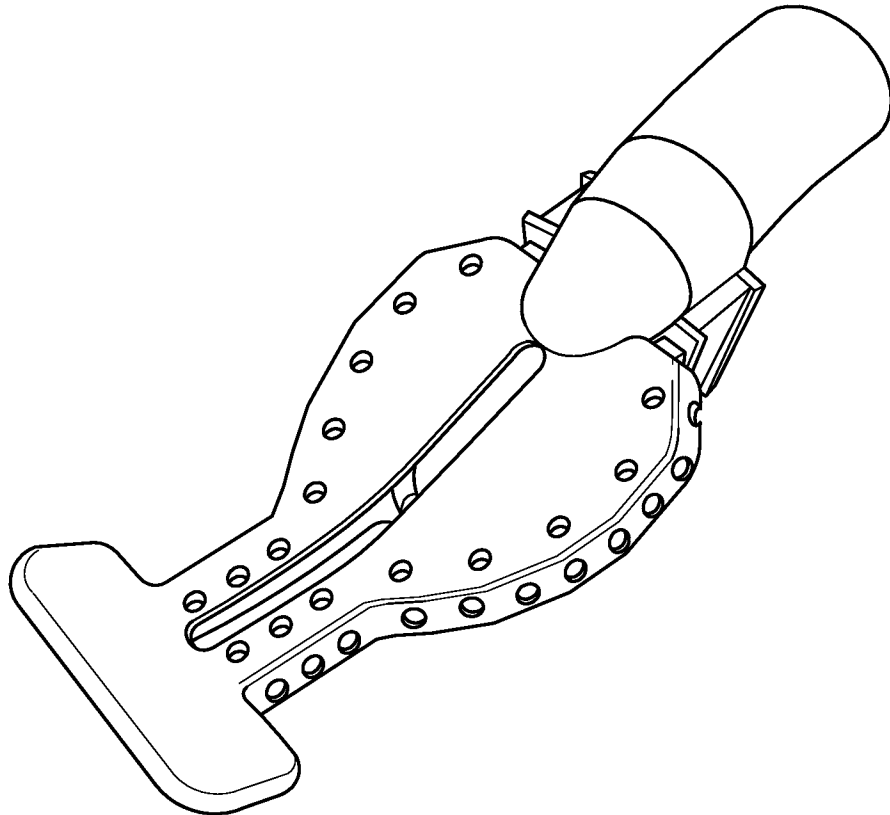


FIG. 1A



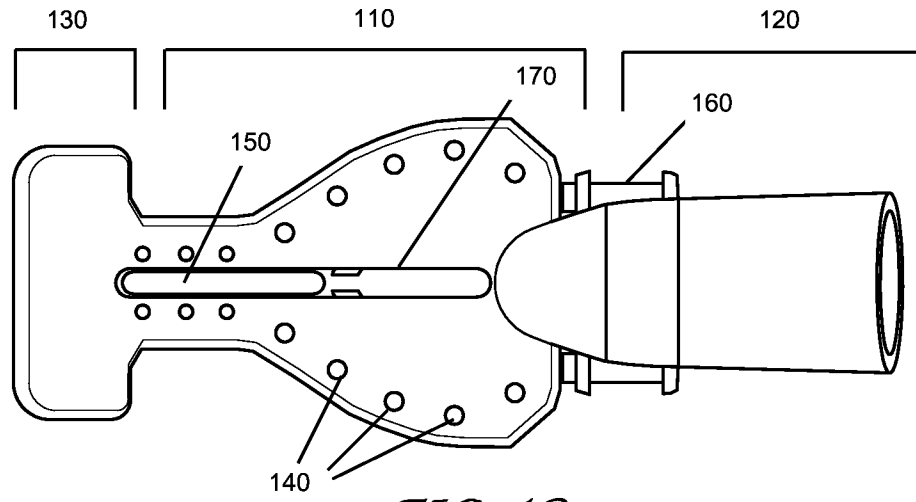


FIG. 1B

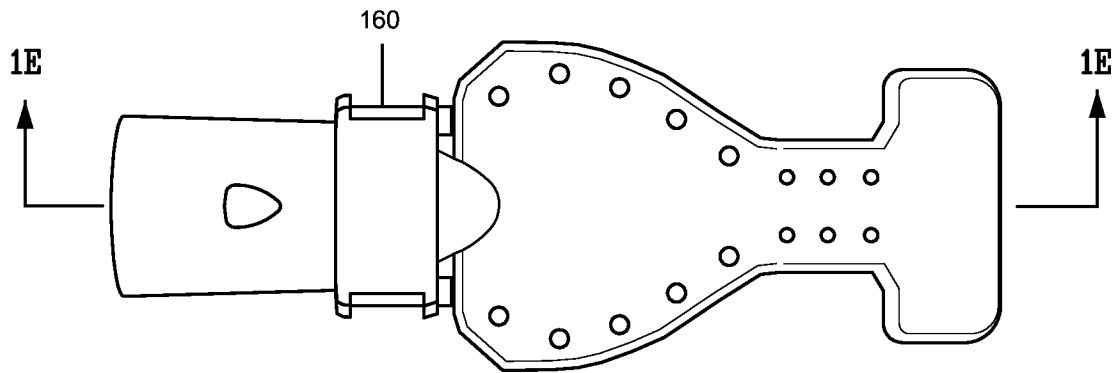
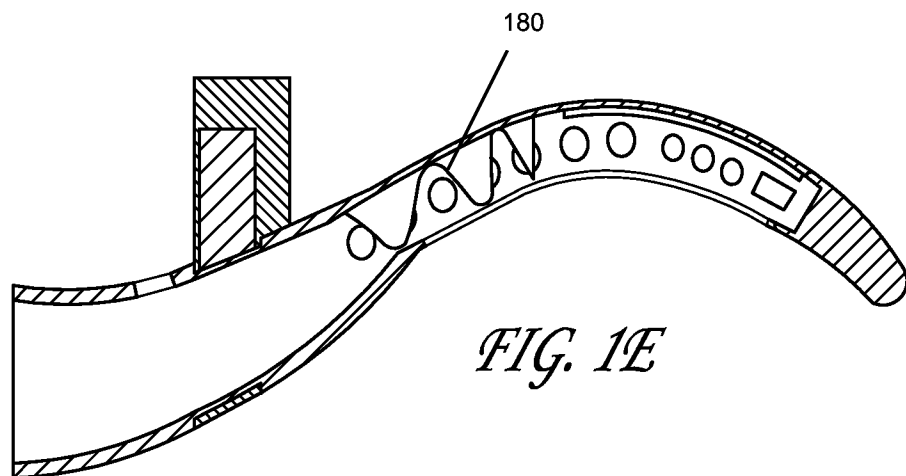
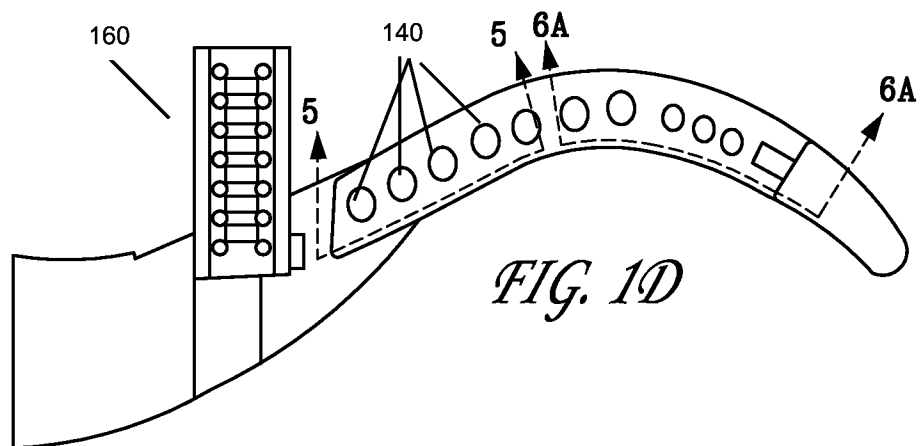


FIG. 1C





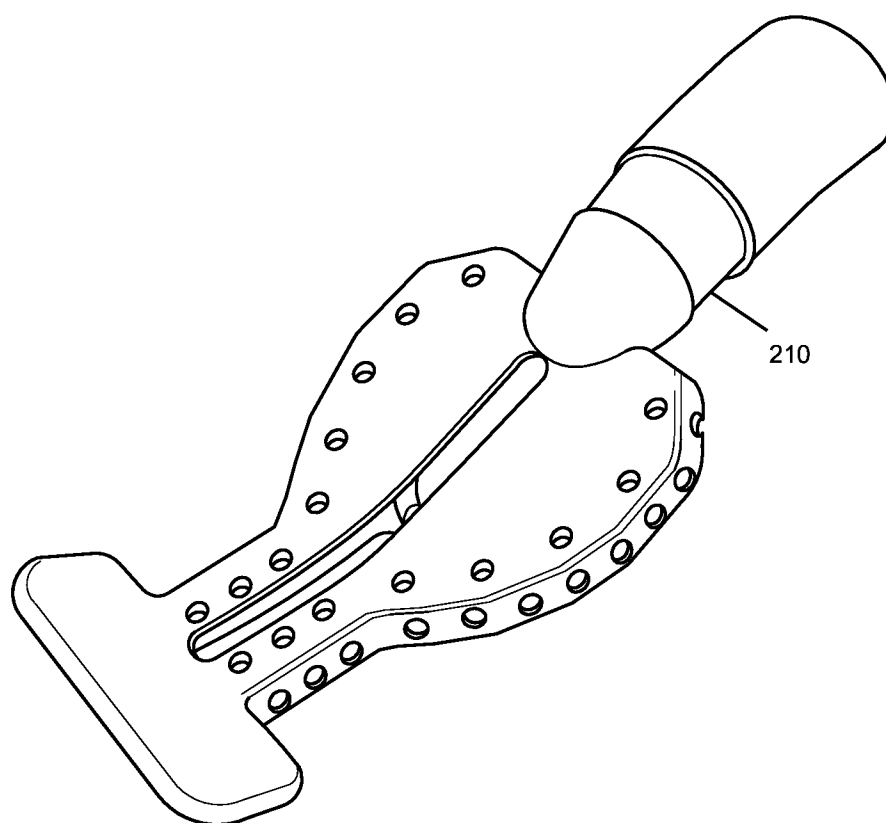


FIG. 2A



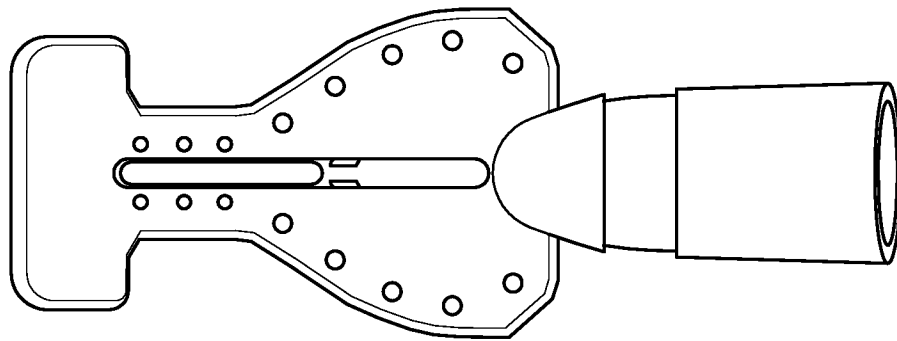


FIG. 2B

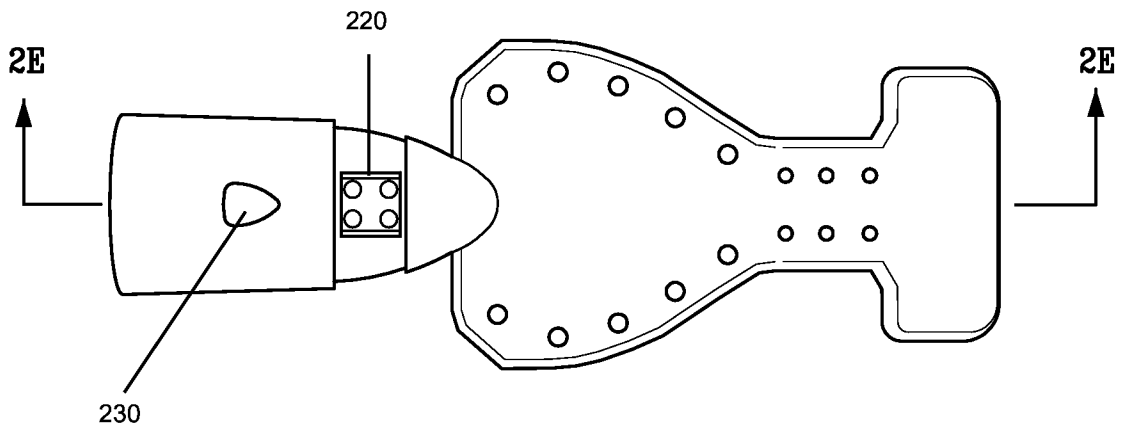


FIG. 2C



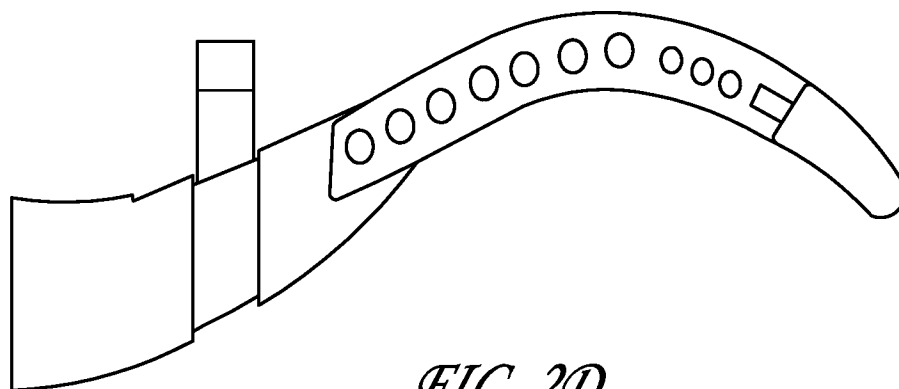


FIG. 2D

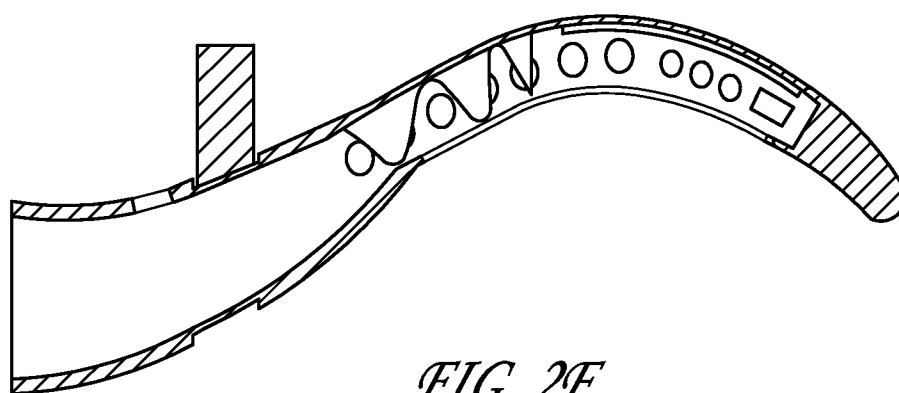


FIG. 2E



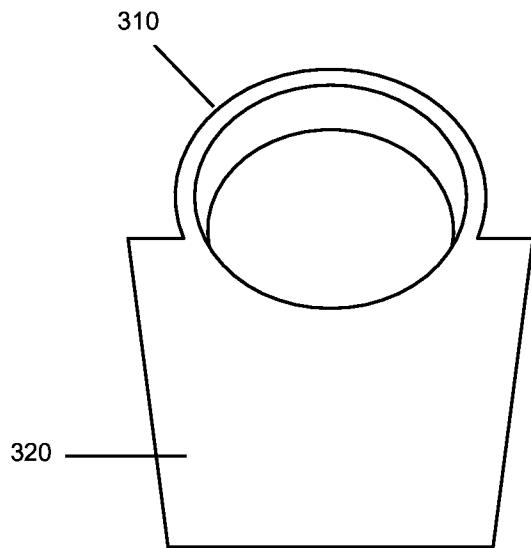


FIG. 3A

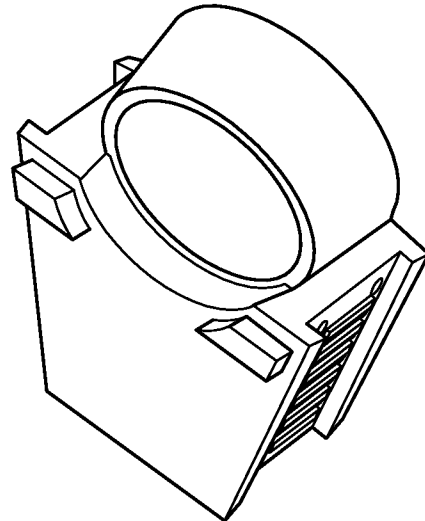


FIG. 3D

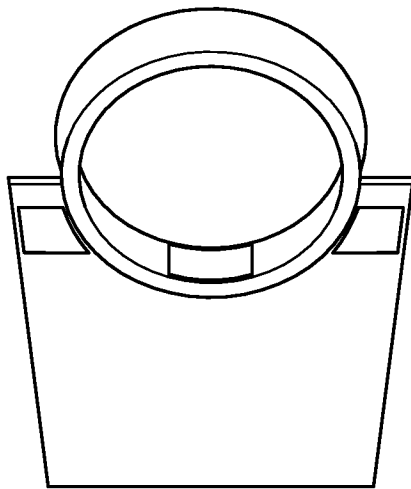


FIG. 3B

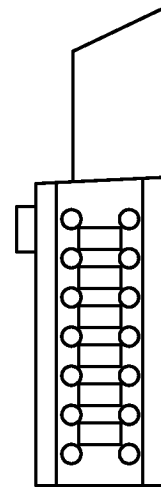


FIG. 3E

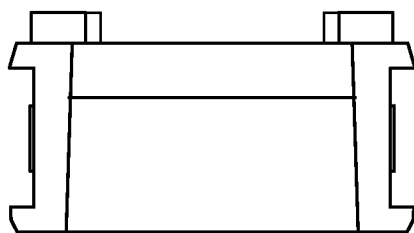


FIG. 3C

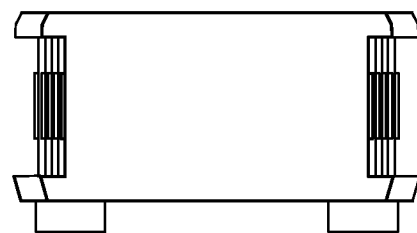


FIG. 3F



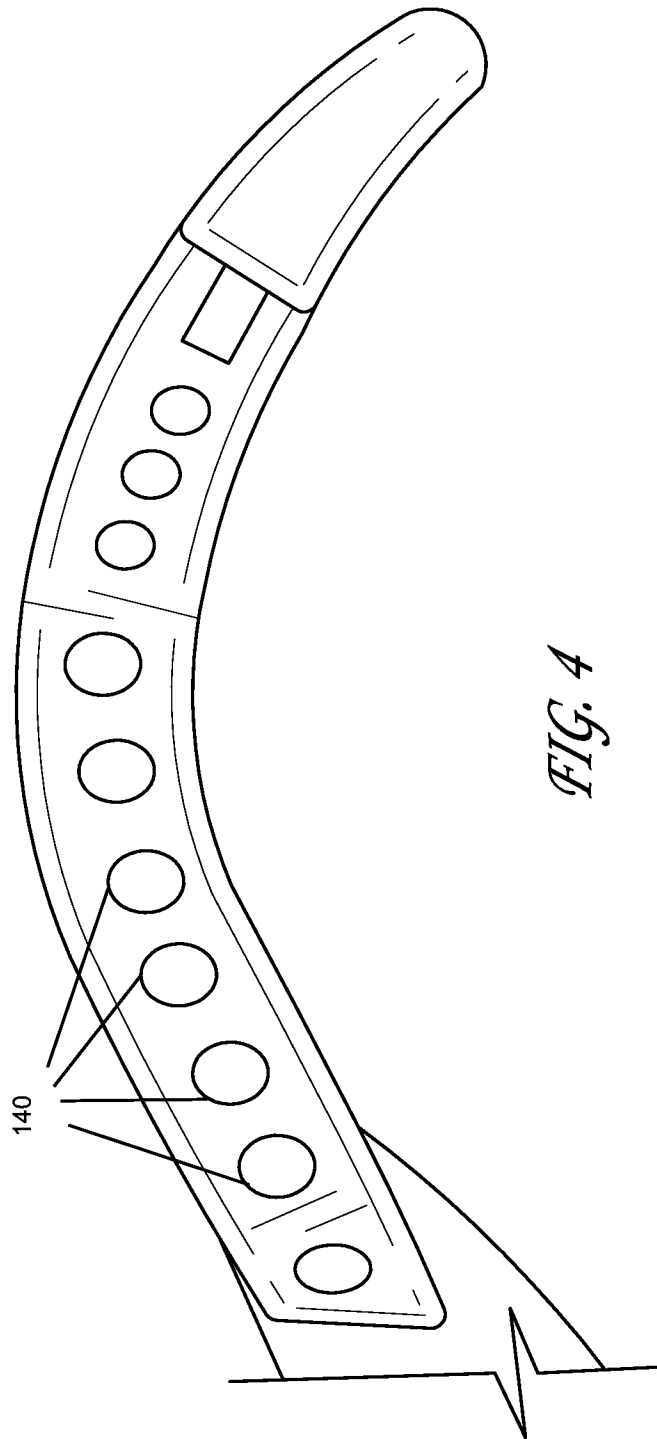


FIG. 4



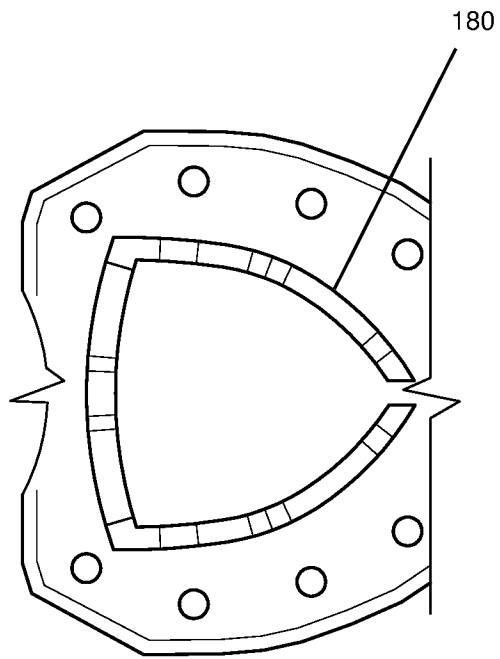


FIG. 5

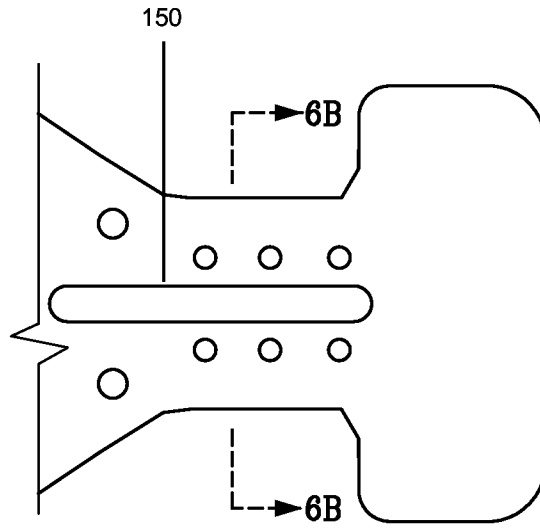


FIG. 6A

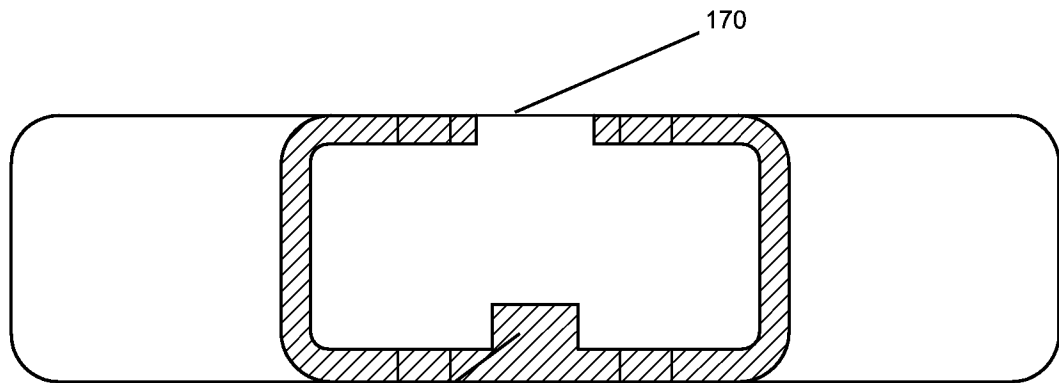


FIG. 6B

150



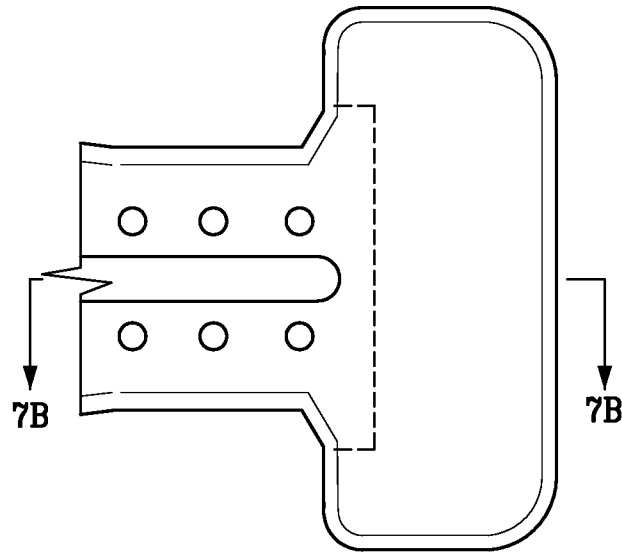


FIG. 7A

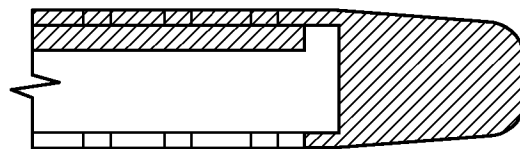


FIG. 7B



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☒

Practitioners associated with Customer Number:

138718

OR

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Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number

Name	Registration Number

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The address associated with Customer Number: 138718

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Firm or individual name

Address

City

State

Zip

Country

Telephone

Email

Assignee name and address: Solmetex, LLC
50 Bearfoot Rd.
Northborough, MA 01532

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SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee.

Signature

Lauren Nagel

/

Date 1/10/2023

Name Lauren Nagel

Telephone

Title Chief Operating Officer

This collection of information is required by 37 CFR 1.31, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public, which is to update (and by the USPTO to process) the file of a patent or reexamination proceeding. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 18 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **Intraoral Dental Suction and Isolation System** the specification of which was filed **December 9, 2013** and assigned U.S. patent application **14/100,323**.

I hereby state that the above-identified application was made or authorized to be made by me.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

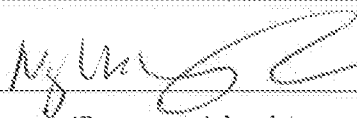
Full name of inventor:

Thien Nguyen

Citizenship:

U.S. CITIZEN

Inventor's signature:



(Permanent ink only)

Dated (optional):

(Date)

Mailing Address:

**92 Corporate Park
Suite C, #818
Irvine, California 92606**

Residence:

Santa Ana, California
(Japan: prefecture, city, village, city ward, etc.; US: city and state)

37 CFR §1.56 Duty to disclose information material to patentability.

(a) A patent by its very nature is affected with a public interest. The public interest is best served, and the most effective patent examination occurs when, at the time an application is being examined, the Office is aware of and evaluates the teachings of all information material to patentability. Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section. The duty to disclose information exists with respect to each pending claim until the claim is cancelled or withdrawn from consideration, or the application becomes abandoned. Information material to the patentability of a claim that is cancelled or withdrawn from consideration need not be submitted if the information is not material to the patentability of any claim remaining under consideration in the application. There is no duty to submit information which is not material to the patentability of any existing claim. The duty to disclose all information known to be material to patentability is deemed to be satisfied if all information known to be material to patentability of any claim issued in a patent was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)(4) and 1.98. However, no patent will be granted on an application in connection with which fraud on the Office was practiced or attempted or the duty of disclosure was violated through bad faith or intentional misconduct. The Office encourages applicants to carefully examine:

(1) Prior art cited in search reports of a foreign patent office in a counterpart application, and

(2) The closest information over which individuals associated with the filing or prosecution of a patent application believe any pending claim patentably defines, to make sure that any material information contained therein is disclosed to the Office.

(b) Under this section, information is material to patentability when it is not cumulative to information already of record or being made of record in the application, and

(1) It establishes, by itself or in combination with other information, a *prima facie* case of unpatentability of a claim; or

(2) It refutes, or is inconsistent with, a position the applicant takes in:

(i) Opposing an argument of unpatentability relied on by the Office, or

(ii) Asserting an argument of patentability. A *prima facie* case of unpatentability is established when the information compels a conclusion that a claim is unpatentable under the preponderance of evidence, burden of proof standard, giving each term in the claim its broadest reasonable construction consistent with the specification, and before any consideration is given to evidence which may be submitted in an attempt to establish a contrary conclusion of patentability.

(c) Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

DECLARATION FOR PATENT APPLICATION

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am an original inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled **Intraoral Dental Suction and Isolation System** the specification of which was filed **December 9, 2013** and assigned U.S. patent application **14/100,323**.

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Full name of inventor: **Tam Thanh Pham**

Citizenship: USA



Inventor's signature:

(Permanent ink only)

Dated (optional): May 19, 2014

(Date)

Mailing Address: **92 Corporate Park
Suite C, #818
Irvine, California 92606**

Residence: San Francisco, California

(Japan: prefecture, city, village, city ward, etc.; US: city and state)

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(1) Each inventor named in the application;

(2) Each attorney or agent who prepares or prosecutes the application; and

(3) Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

(d) Individuals other than the attorney, agent or inventor may comply with this section by disclosing information to the attorney, agent, or inventor.

(e) In any continuation-in-part application, the duty under this section includes the duty to disclose to the Office all information known to the person to be material to patentability, as defined in paragraph (b) of this section, which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: Not Yet Assigned

Examiner: Not Yet Assigned

Serial No.: Not Yet Assigned

Filed: Herewith

In re Application of: Thien Nguyen et al.

Confirmation No.: Not Yet Assigned

Customer No.: 138718

Title: INTRAORAL DEVICE

INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application. Copies of listed foreign patent documents and/or non-patent literature are enclosed pursuant to 37 C.F.R. § 1.98(a)(2). Because this information disclosure statement is being filed before the mailing of a first office action on the merits, no certification statement under 37 C.F.R. § 1.97(e) is required.

Copies of all foreign and non-patent references were previously submitted in U.S. Patent Application number 18/679,097 filed May 30, 2024, to which the present application makes a claim of priority under 35 U.S.C. §120. As such, no copies are provided herewith.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POLSINELLI LLP

Dated: September 3, 2024

By: /Ruby Chung/
Ruby Chung (76,809)
Polsinelli LLP
Three Embarcadero Center, Suite 2400
San Francisco, CA 94111
415-248-2100 (Main)
patentdocketing@polsinelli.com

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)First Named Inventor/Patent Owner: SOLMETEX, LLC

Application No./Patent No.: _____ Filed/Issue Date: _____

Titled: INTRAORAL DEVICESOLMETEX, LLC, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that, for the patent application/patent identified above, it is (choose **one** of options 1, 2, 3 or 4 below):

1. ☒ The assignee of the entire right, title, and interest.
2. ☐ An assignee of less than the entire right, title, and interest (check applicable box):
- ☐ The extent (by percentage) of its ownership interest is _____%. Additional Statement(s) by the owners holding the balance of the interest must be submitted to account for 100% of the ownership interest.
- ☐ There are unspecified percentages of ownership. The other parties, including inventors, who together own the entire right, title and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

3. ☐ The assignee of an undivided interest in the entirety (a complete assignment from one of the joint inventors was made). The other parties, including inventors, who together own the entire right, title, and interest are:

Additional Statement(s) by the owner(s) holding the balance of the interest must be submitted to account for the entire right, title, and interest.

4. ☐ The recipient, via a court proceeding or the like (e.g., bankruptcy, probate), of an undivided interest in the entirety (a complete transfer of ownership interest was made). The certified document(s) showing the transfer is attached.

The interest identified in option 1, 2 or 3 above (not option 4) is evidenced by either (choose **one** of options A or B below):

- A. ☐ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel _____, Frame _____, or for which a copy thereof is attached*.
- B. ☒ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: Inventors To: INCEPT, INC.The document was recorded in the United States Patent and Trademark Office at
Reel 067603, Frame 0522, or for which a copy thereof is attached*.2. From: INCEPT INCORPORATED To: DRYSHIELD, LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 067607, Frame 0952, or for which a copy thereof is attached*.

[Page 1 of 2]

A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995, unless the information collection has a currently valid OMB Control Number. The OMB Control Number for this information collection is 0651-0031. Public burden for this form is estimated to average 12 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the Chief Administrative Officer, United States Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450 or email InformationCollection@uspto.gov. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(c)3. From: DRYSHIELD, LLC To: SOLMETEX, LLCThe document was recorded in the United States Patent and Trademark Office at
Reel 067603, Frame 0524, or for which a copy thereof is attached*.

4. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached*.

5. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached*.

6. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached*.☐ Additional documents in the chain of title are listed on a supplemental sheet(s).☒ *As required by 37 CFR 3.73(c)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Ruby Chung/2024-09-03

Signature

Date

Ruby Chung76809

Printed or Typed Name

Title or Registration Number

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013). <https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to:

- 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
- 2) a federal, state, local, or international agency, in response to its request;
- 3) a contractor of the USPTO having need for the information in order to perform a contract;
- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
- 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned				
Attorney Docket No.	INCEP-001COH				
Sheet	1	of	14		

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.*	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)				
		US-	D267,586	01-11-1983	Hatlen	
		US-	D364,456	11-21-1995	Solnit	
		US-	D495,799	09-07-2004	Hirsch et al.	
		US-	D497,426	10-19-2004	Hirsch et al.	
		US-	D615,203	05-04-2010	Hirsch et al.	
		US-	D663,831	07-17-2012	Sidhu	
		US-	D666,726	09-04-2012	Davis et al.	
		US-	D696,779	12-31-2013	Hirsch et al.	
		US-	D734,851	07-21-2015	Nguyen	
		US-	D735,858	08-04-2015	Hirsch et al.	
		US-	D737,964	09-01-2015	Jessop et al.	
		US-	D782,047	03-21-2017	Ritter	
		US-	D782,048	03-21-2017	Ritter	
		US-	D787,069	05-16-2017	Ritter	
		US-	D787,070	05-16-2017	Ritter	
		US-	D809,660	02-06-2018	Nguyen et al.	
		US-	D833,029	11-06-2018	Guenst et al.	
		US-	D868,958	12-03-2019	Reyes	
		US-	D876,627	02-25-2020	Nguyen et al.	
		US-	D962,438	08-30-2022	Nguyen et al.	
		US-	D962,439	08-30-2022	Nguyen et al.	
		US-	D1,033,650	07-02-2024	Nguyen et al.	
		US-	D1,037,436	07-30-2024	Nguyen et al.	
		US-	50,461	10-17-1865	Dibble	
		US-	1,471,207	10-16-1923	Napoleon	
		US-	1,731,322	10-15-1929	Riddle	
		US-	2,019,612	11-05-1935	Langhans et al.	
		US-	2,937,445	05-24-1960	Erickson	
		US-	3,090,122	05-21-1963	Erickson	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

*Applicant's unique citation designation number (optional). *Applicant is to place a check mark here if English Translation is attached.

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If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
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				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned				
Attorney Docket No.	INCEP-001COH				
Sheet	2	of	14		

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code²(If known)				
		US-	3,379,192	04-23-1968	Warren	
		US-	3,453,735	07-08-1969	Burt	
		US-	3,489,141	01-13-1970	Warren	
		US-	3,516,160	06-23-1970	Leffler	
		US-	3,758,950	09-18-1973	Krouzian	
		US-	3,768,477	10-30-1973	Anders et al.	
		US-	3,802,081	04-09-1974	Rogers	
		US-	3,857,181	12-31-1974	Rappaport	
		US-	3,877,691	04-15-1975	Foster	
		US-	3,924,333	12-09-1975	Erickson	
		US-	4,017,975	04-19-1977	Johnson	
		US-	4,024,642	05-24-1977	Zorovich	
		US-	4,083,115	04-11-1978	McKelvey	
		US-	4,167,814	09-18-1979	Schubert	
		US-	4,192,071	03-11-1980	Erickson	
		US-	4,237,574	12-09-1980	Kelly et al.	
		US-	4,511,329	04-16-1985	Diamond	
		US-	4,718,662	01-12-1988	North	
		US-	4,802,851	02-07-1989	Rhoades	
		US-	4,822,278	04-18-1989	Oliva et al.	
		US-	4,975,057	12-04-1990	Dyfvermark	
		US-	5,009,595	04-23-1991	Osborn	
		US-	5,037,298	08-06-1991	Hickham	
		US-	5,078,602	01-07-1992	Honoshofsky	
		US-	5,365,624	11-22-1994	Berns	
		US-	5,460,524	10-24-1995	Anderson	
		US-	5,516,286	05-14-1996	Kushner	
		US-	5,588,836	12-31-1996	Landis et al.	
		US-	5,720,275	02-24-1998	Patil et al.	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

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				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned				
Sheet	3	of	14	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code²(If known)				
		US-	5,730,599	03-24-1998	Pak	
		US-	5,762,496	06-09-1998	Albertsson et al.	
		US-	5,890,899	04-06-1999	Sclafani	
		US-	6,022,214	02-08-2000	Hirsch et al.	
		US-	6,213,772	04-10-2001	Costello	
		US-	6,223,376	05-01-2001	Lee	
		US-	6,241,521	06-05-2001	Garrison	
		US-	6,267,591	07-31-2001	Barstow	
		US-	6,338,627	01-15-2002	Hirsch et al.	
		US-	6,575,746	06-10-2003	Hirsch et al.	
		US-	6,652,276	11-25-2003	Fischer et al.	
		US-	6,655,960	12-02-2003	Fischer	
		US-	6,672,305	01-06-2004	Parker	
		US-	6,716,029	04-06-2004	Fischer et al.	
		US-	6,908,308	06-21-2005	Hirsch et al.	
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		US-	8,529,256	09-10-2013	Hirsch et al.	
		US-	8,535,056	09-17-2013	Dragan et al.	
		US-	8,745,802	06-10-2014	Steur	

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				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
Examiner Name	Not Yet Assigned				
Attorney Docket No.	INCEP-001COH				
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U.S. PATENT DOCUMENTS						
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		Number-Kind Code ² (If known)				
		US-	8,911,232	12-16-2014	Nguyen	
		US-	9,084,656	07-21-2015	Hirsch	
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		Number-Kind Code ² (If known)				
		US-	2006/0084031	04-20-2006	Hirsch et al.	
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		US-	2013/0055513	03-07-2013	Meadows et al.	
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		US-	2014/0004478	01-02-2014	Hirsch et al.	
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		Number-Kind Code ² (If known)				
		US-	2015/0305842	10-29-2015	Hirsch et al.	
		US-	2015/0335409	11-26-2015	Hirsch	
		US-	2016/0270892	09-22-2016	Yoo	
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		US-	2018/0368957	12-27-2018	Hyun	
		US-	2020/0155284	05-21-2020	Baker	
		US-	2020/0178680	06-11-2020	Van Dijk	
		US-	2020/0253369	08-13-2020	De Gentile et al.	
		US-	2020/0352680	11-12-2020	Nguyen	
		US-	2020/0383560	12-10-2020	Day	
		US-	2021/0204923	07-08-2021	Ritter	
		US-	2022/0087799	03-24-2022	Glen et al.	
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Examiner Initials*	Cite No.¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code³ Number⁴ Kind Codes (if known)				
		BR 112021022474 A2	01-04-2022	DRYSHIELD, LLC		

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		CA 2,851,861	06-09-2015	Incept, Inc.		
		CA 3,139,689	11-19-2020	Dryshield, LLC		
		CN 102026587	04-20-2011	Dentozone Co. Ltd.		
		CN 102247140	11-23-2011	Third Hospital Xinxiang Medical		
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		EP 2903557	08-12-2015	Incept, Inc.		
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		FR 2992161	12-27-2013	Braud Vincent		
		GB 2 170 106	07-30-1986	Liegner		
		JP 2017-518859	07-13-2017	INNERLITE, INC.		
		JP 2022-533276	07-21-2022	Dryshield, LLC		
		KR 100654392	12-06-2006	Kim Jae Soo		
		KR 20220103035 A	07-21-2022	DRYSHIELD, LLC		
		MX 2021013694 A	04-07-2022	DRYSHIELD, LLC		
		TW 202108088	03-01-2021	Dryshield, LLC		
		WO 1999/037238	07-29-1999	Ohguchi		
		WO 2000/42939	07-27-2000	Michael Engeron		
		WO 00/61031	10-19-2000	William Costello		
		WO 2011/014952	02-10-2011	University of Manitoba		
		WO 2015/088577	06-18-2015	Incept, Inc.		
		WO 2018/126150	07-05-2018	NOVO DENT LLC		
		WO 2020/231864	11-19-2020	Dryshield, LLC		

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NON PATENT LITERATURE DOCUMENTS			
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		Dryshield brochure. Dryshield.com. Publish date: May 2019. Retrieval date: 15 September 2021. Retrieved from internet: https://dryshield.com/ds/Brochure_May2019.pdf (Year: 2019)	
		"Dryshield (single-use) vs. Zryis/Isolite (single-use) mouthpieces" posted by Mark Frias, RDH. Youtube. Posting date: 18 January 2020. Retrieval date: 15 September 2021. Retrieved from internet: https://www.youtube.com/watch?v=uKX9XahOEY (Year: 2020)	
		"Dryshield Presentation (Learn all about Dryshield)" posted by Dryshield isolation System. Youtube. Posting date: 27 October 2014. Retrieval date: 15 September 2021. Retrieved from internet: https://www.youtube.com/watch?v=fcbpz3ixvis (Year: 2014)	
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		PCT Application No. PCT/US2014/032892, International Preliminary Report on Patentability dated 6/14/16	
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		Australian Application No. 2014202637, AU Examination Report dated 1/23/15	
		Brazilian Application No. BR1120140116377, Preliminary Office Action 1/7/20	
		Canadian Application No. 2,919,142, CA Examination Report dated 5/31/16	
		Chinese Application No. 201480039991.2, First Office Action dated 12/29/16	

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		Columbian Application No. NC2021/0016591, First Substantive Examination dated 1/30/24	
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		European Application No. 20804801.7, Extended European Search Report dated 4/20/23	
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		Docket No. INCEP-001, U.S. Application 14/100,323, Final Office Action mailed 10/24/14	
		Docket No. INCEP-001, U.S. Application 14/100,323, Office Action mailed 5/6/14	

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		Docket No. INCEP-001COA, U.S. Application 14/228,046, Office Action mailed 10/6/21	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Final Office Action mailed 11/27/20	
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		Docket No. INCEP-001COB, U.S. Application 14/228,050, Office Action mailed 11/6/15	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 1/3/22	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

'Applicant's unique citation designation number (optional). 'Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	11	of	14	Attorney Docket No.	INCEP-001COH

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 6/25/21	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 12/22/20	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 1/13/20	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 8/8/19	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 11/29/18	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 11/2/17	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 4/24/17	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 12/3/15	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 1/5/23	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 9/2/22	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 11/12/21	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 5/5/21	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 5/19/20	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 10/7/19	

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	12	of	14	Attorney Docket No.	INCEP-001COH

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 3/22/19	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 9/7/18	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 11/2/17	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 4/13/17	
		Docket No. INCEP-001COD U.S. Application 14/228,057; Final Office Action mailed 6/7/16	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 11/20/15	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 12/8/21	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 4/29/21	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 11/27/20	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 1/10/20	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 7/11/19	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 10/4/18	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 10/20/17	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 4/12/17	

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	13	of	14	Attorney Docket No.	INCEP-001COH

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 6/30/16	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 12/4/15	
		Docket No. INCEP-002DCOA, U.S. Application 29/491,367, Final Office Action mailed 3/4/15	
		Docket No. INCEP-002DCOA, U.S. Application 29/491,367, Office Action mailed 11/14/14	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Final Office Action mailed 6/1/16	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Office Action mailed 11/27/15	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Final Office Action mailed 5/1/15	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Office Action mailed 11/14/14	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 3/21/17	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Final Office Action mailed 6/1/16	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 12/2/15	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Final Office Action mailed 5/1/15	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 11/14/14	
		Docket No. INCEP-005, U.S. Application 16/870,745, Office Action mailed 2/17/23	

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	14	of	14	Attorney Docket No.	INCEP-001COH

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Docket No. INCEP-005, U.S. Application 16/870,745, Final Office Action mailed 5/12/22	
		Docket No. INCEP-005, U.S. Application 16/870,745, Office Action mailed 12/3/21	
		Docket No. INCEP-005COA, U.S. Application 18/376,309, Office Action mailed 7/1/24	
		Docket No. INCEP-006D, U.S. Application 29/782,645, Office Action mailed 10/4/21	
		Docket No. INCEP-008D, U.S. Application 29/782,638, Office Action mailed 10/4/21	
		Docket No. INCEP-009D, U.S. Application 29/782,644, Final Office Action mailed 5/11/22	
		Docket No. INCEP-009D, U.S. Application 29/782,644, Office Action mailed 10/4/21	
		Docket No. INCEP-010D, U.S. Application 29/782,643, Final Office Action mailed 5/11/22	
		Docket No. INCEP-010D, U.S. Application 29/782,643, Office Action mailed 10/4/21	
		Docket No. INCEP-011D, U.S. Application 29/893,986, Ex Parte Quayle mailed 8/15/2023	
		Docket No. INCEP-001COF, U.S. Application 18/217,304, Office Action mailed 9/29/2023	

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
09/04/2024 11:14:09 AM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 67018542

FILING DATE -

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Ruby Chung

Documents

TOTAL DOCUMENTS: 10

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH_ADS.pdf	9	Application Data Sheet	2174 KB
INCEP-001COH_Continuation_Application-APP.TEXT.docx	17	Application body structured text document	31 KB
INCEP-001COH_Figures.pdf	11	Drawings-only black and white line drawings	400 KB
INCEP-001COH_DEC_parent.pdf	4	Oath or Declaration filed	365 KB
INCEP-001COH_POA.pdf	1	Power of Attorney	52 KB
INCEP-001COH_373C_STMT.pdf	3	Power of Attorney	230 KB
INCEP-	1	Track One Request	148 KB

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INCEP-001COH_IDS Transmittal.pdf	2	Transmittal Letter	72 KB
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INCEP- 001COH_IDS_1449.pdf	14	Information Disclosure Statement (IDS) Form (SB08)	270 KB
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INCEP- 001COH_Continuation_Appli cation.pdf	17	Auxiliary PDF of Application	172 KB
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DOCUMENT

MESSAGE DIGEST(SHA-512)

INCEP-001COH_ADS.pdf	02D705C0FC941A4820ADB26F9ABBF968F4492AF1BA81FA205 F3555F41A1F6A7A0FAA8740B0ABB0284206D4F3D364CD8ED4 095C12F75873984F78C5A005C50682
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INCEP-001COH_IDS Transmittal.pdf	2D3A3D4651DC1D6D54115FAFDDCA271BD1F0930265F3EB14 1AE028F352EC65405EE1A99EF91F9AAC48254D622C094662B 4E780E29E5FF3642CA7CE9CECD13801
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INCEP-001COH_Continuation_Application.pdf	F860DA747FE7B58512B5A82F22999DABE21BFEC9A98C28E5 FCB353B19F0DC391B861AD672A245796558F0116814866F18B A2D4CFF1766100D59724415BF934C3

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
18/823,885	09/04/2024		984	INCEP-001COH	28	3

CONFIRMATION NO. 8808

138718
Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

FILING RECEIPT



0000000077863728

Date Mailed: 09/17/2024

Receipt is acknowledged of this non-provisional utility patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF FIRST INVENTOR, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection.

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Inventor(s)

Thien Nguyen, Santa Ana, CA;
Tam Thanh Pham, San Francisco, CA;

Applicant(s)

SOLMETEX, LLC, Northborough, MA;

Power of Attorney: The patent practitioners associated with Customer Number 138718

Domestic Priority data as claimed by applicant

This application is a CON of 18/679,097 05/30/2024
which is a CON of 18/217,304 06/30/2023 PAT 12,011,329
which is a CON of 14/228,057 03/27/2014 PAT 11,744,686
which is a CON of 14/100,323 12/09/2013 PAT 8,911,232
which claims benefit of 61/734,939 12/07/2012

Foreign Applications for which priority is claimed (You may be eligible to benefit from the Patent Prosecution Highway program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 09/12/2024

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 18/823,885**

Projected Publication Date: 12/26/2024

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

INTRAORAL DEVICE

Preliminary Class

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number
18/823,885

APPLICATION AS FILED - PART I

(Column 1)		(Column 2)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	64		N/A	
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A	280		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	320		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	28 minus 20 =	8	x 40 =	320	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =		x =	0			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	984		TOTAL	

APPLICATION AS AMENDED - PART II

(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Total (37 CFR 1.16(i))	*	Minus **	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))						OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						OR		
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

(Column 1)		(Column 2)	(Column 3)	SMALL ENTITY		OR	OTHER THAN SMALL ENTITY	
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
Total (37 CFR 1.16(i))	*	Minus **	=	x =		OR	x =	
Independent (37 CFR 1.16(h))	*	Minus ***	=	x =		OR	x =	
Application Size Fee (37 CFR 1.16(s))						OR		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						OR		
				TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.



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Under Secretary of Commerce for Intellectual Property and
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Derrick Brent

Deputy Under Secretary of Commerce for Intellectual Property and
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
138718	7590	10/04/2024	EXAMINER	
Polsinelli LLP			CENTRAL, DOCKET	
PO Box 140310			ART UNIT	PAPER NUMBER
Kansas City, MO 64114-0310			OPAP	
			NOTIFICATION DATE	DELIVERY MODE
			10/04/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocketing@polsinelli.com
sfpatent@polsinelli.com

<i>Decision Granting Request for Prioritized Examination (Track I)</i>	Application No. 18/823,885	Applicant(s) Nguyen et al.	
	Examiner FIKIRTE A GEREMEW	Art Unit OMBL	AIA (FITF) Status No
1. THE REQUEST FILED <u>04 September 2024</u> IS GRANTED . The above-identified application has met the requirements for prioritized examination A. ☒ for an original nonprovisional application (Track I). B. ☐ for an application undergoing continued examination (RCE). 2. The above-identified application will undergo prioritized examination. The application will be accorded special status throughout its entire course of prosecution until one of the following occurs: A. filing a <u>petition for extension of time</u> to extend the time period for filing a reply; B. filing an <u>amendment to amend the application to contain more than four independent claims, more than thirty total claims</u>, or a multiple dependent claim; C. filing a <u>request for continued examination</u> ; D. filing a notice of appeal; E. filing a request for suspension of action; F. mailing of a notice of allowance; G. mailing of a final Office action; H. completion of examination as defined in 37 CFR 41.102; or I. abandonment of the application. Telephone inquiries with regard to this decision should be directed to FIKIRTE GEREMEW at (703) 756-1930. In his/her absence, calls may be directed to Petition Help Desk at (571) 272-3282.			
/FIKIRTE A GEREMEW/ PROGRAM SUPPORT SPECIALIST, OMBL			

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POL SINELLI LLP

Dated: October 23, 2024

By: /Ruby Chung/
Ruby Chung (76,809)
Polsinelli LLP
Three Embarcadero Center, Suite 2400
San Francisco, CA 94111
415-248-2100 (Main)
patentdocketing@polsinelli.com

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
				Examiner Name	Mirayda Arlene Aponte
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US- 12,011,329	06-18-2024	Nguyen et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Mexican Application No. MX/a/2021/013694, Official Action dated 10/2/24	
		New Zealand Application No. 782154, Examination Report dated 10/9/24	
		Docket No. INCEP-012D, U.S. Application 29/950,233, Ex Parte Quayle Action dated 9/19/24	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
10/29/2024 10:48:06 AM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 67678510

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Ruby Chung

Documents

TOTAL DOCUMENTS: 4

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - IDS Transmittal.pdf	1	Transmittal Letter	70 KB
INCEP-001COH - IDS 1449.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	166 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
NPL_INCEP- 005NZ_Examination Report 10-9-2024.pdf	3	Non Patent Literature	146 KB
NPL_INCEP-005MX_Official Report dated 10-2-2024.pdf	5	Non Patent Literature	472 KB

Digest

DOCUMENT

MESSAGE DIGEST(SHA-512)

INCEP-001COH - IDS
Transmittal.pdf

C911C5ADB99F0B644C04E278E584848FD353FCF75105DE9F3
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NPL_INCEP-
005NZ_Examination Report 10-
9-2024.pdf

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Report dated 10-2-2024.pdf

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BFCF55CF03F8A42CD7AD46F41F00D2BD32360DEB62DBE9C
FADCA994F73EE078AEB6FD2F417DF23

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

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<i>Index of Claims</i> 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM			DATE							
Final	Original	11/11/2024								
	1	✓								
	2	✓								
	3	✓								
	4	✓								
	5	✓								
	6	✓								
	7	✓								
	8	✓								
	9	✓								
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	21	✓								
	22	✓								
	23	✓								
	24	✓								
	25	✓								
	26	✓								
	27	✓								
	28	✓								

<i>Search Notes</i> 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

CPC - Searched*		
Symbol	Date	Examiner
A61C17/08 ,0208,06,00,02,43,046	11/11/2024	MA

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
433	91-93,140	11/11/2024	MA

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
PE2Esearch	11/11/2024	MA
Word search, cardboard AND corrugated, cardboard AND corrugated AND box, box AND cardboard WITH corrugated, box AND cardboard WITH corrugated SAME force, box AND cardboard WITH corrugated SAME force SAME compressing, (mouthpiece device) AND (wave ondulat*) AND vacuum	11/11/2024	MA
(Artificial Intelligence) More like doc: US-20200352680-A1, US-20140162209-A1, CA-2851861-A1, JP-S63158813-U	11/11/2024	MA
Overview search done on parent application 14100323	11/11/2024	MA

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	
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<i>Search Notes</i> 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	
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Bibliographic Data

Application No: 18/823,885

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /MIRAYDA A APONTE/

Examiner's Signature

Initials

Title: INTRAORAL DEVICE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/04/2024	433	3772	INCEP-001COH
RULE			

APPLICANTS

SOLMETEX, LLC, Northborough, MA, UNITED STATES

INVENTORS

Thien Nguyen, Santa Ana, CA, UNITED STATES

Tam Thanh Pham, San Francisco, CA, UNITED STATES

CONTINUING DATA

This application is a CON of 18679097 05/30/2024

18679097 is a CON of 18217304 06/30/2023 PAT 12011329

18217304 is a CON of 14228057 03/27/2014 PAT 11744686

14228057 is a CON of 14100323 12/09/2013 PAT 8911232

14100323 has PRO of 61734939 12/07/2012

FOREIGN APPLICATIONS

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				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	1	of	14	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code²(If known)				
		US-	D267,586	01-11-1983	Hatlen	
		US-	D364,456	11-21-1995	Solnit	
		US-	D495,799	09-07-2004	Hirsch et al.	
		US-	D497,426	10-19-2004	Hirsch et al.	
		US-	D615,203	05-04-2010	Hirsch et al.	
		US-	D663,831	07-17-2012	Sidhu	
		US-	D666,726	09-04-2012	Davis et al.	
		US-	D696,779	12-31-2013	Hirsch et al.	
		US-	D734,851	07-21-2015	Nguyen	
		US-	D735,858	08-04-2015	Hirsch et al.	
		US-	D737,964	09-01-2015	Jessop et al.	
		US-	D782,047	03-21-2017	Ritter	
		US-	D782,048	03-21-2017	Ritter	
		US-	D787,069	05-16-2017	Ritter	
		US-	D787,070	05-16-2017	Ritter	
		US-	D809,660	02-06-2018	Nguyen et al.	
		US-	D833,029	11-06-2018	Guenst et al.	
		US-	D868,958	12-03-2019	Reyes	
		US-	D876,627	02-25-2020	Nguyen et al.	
		US-	D962,438	08-30-2022	Nguyen et al.	
		US-	D962,439	08-30-2022	Nguyen et al.	
		US-	D1,033,650	07-02-2024	Nguyen et al.	
		US-	D1,037,436	07-30-2024	Nguyen et al.	
		US-	50,461	10-17-1865	Dibble	
		US-	1,471,207	10-16-1923	Napoleon	
		US-	1,731,322	10-15-1929	Riddle	
		US-	2,019,612	11-05-1935	Langhans et al.	
		US-	2,937,445	05-24-1960	Erickson	
		US-	3,090,122	05-21-1963	Erickson	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
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U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code²(If known)				
		US-	3,379,192	04-23-1968	Warren	
		US-	3,453,735	07-08-1969	Burt	
		US-	3,489,141	01-13-1970	Warren	
		US-	3,516,160	06-23-1970	Leffler	
		US-	3,758,950	09-18-1973	Krouzian	
		US-	3,768,477	10-30-1973	Anders et al.	
		US-	3,802,081	04-09-1974	Rogers	
		US-	3,857,181	12-31-1974	Rappaport	
		US-	3,877,691	04-15-1975	Foster	
		US-	3,924,333	12-09-1975	Erickson	
		US-	4,017,975	04-19-1977	Johnson	
		US-	4,024,642	05-24-1977	Zorovich	
		US-	4,083,115	04-11-1978	McKelvey	
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		US-	4,237,574	12-09-1980	Kelly et al.	
		US-	4,511,329	04-16-1985	Diamond	
		US-	4,718,662	01-12-1988	North	
		US-	4,802,851	02-07-1989	Rhoades	
		US-	4,822,278	04-18-1989	Oliva et al.	
		US-	4,975,057	12-04-1990	Dyfvermark	
		US-	5,009,595	04-23-1991	Osborn	
		US-	5,037,298	08-06-1991	Hickham	
		US-	5,078,602	01-07-1992	Honoshofsky	
		US-	5,365,624	11-22-1994	Berns	
		US-	5,460,524	10-24-1995	Anderson	
		US-	5,516,286	05-14-1996	Kushner	
		US-	5,588,836	12-31-1996	Landis et al.	
		US-	5,720,275	02-24-1998	Patil et al.	

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		Number-Kind Code²(If known)				
		US-	5,730,599	03-24-1998	Pak	
		US-	5,762,496	06-09-1998	Albertsson et al.	
		US-	5,890,899	04-06-1999	Sclafani	
		US-	6,022,214	02-08-2000	Hirsch et al.	
		US-	6,213,772	04-10-2001	Costello	
		US-	6,223,376	05-01-2001	Lee	
		US-	6,241,521	06-05-2001	Garrison	
		US-	6,267,591	07-31-2001	Barstow	
		US-	6,338,627	01-15-2002	Hirsch et al.	
		US-	6,575,746	06-10-2003	Hirsch et al.	
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		US-	6,655,960	12-02-2003	Fischer	
		US-	6,672,305	01-06-2004	Parker	
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		US-	6,908,308	06-21-2005	Hirsch et al.	
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		US-	7,287,981	10-30-2007	Hirsch	
		US-	7,293,990	11-13-2007	Hirsch et al.	
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		US-	7,748,981	07-06-2010	Hirsch et al.	
		US-	8,029,280	10-04-2011	Black et al.	
		US-	8,057,227	11-15-2011	Hirsch et al.	
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		US-	8,075,310	12-13-2011	Hirsch et al.	
		US-	8,241,035	08-14-2012	Jones et al.	
		US-	8,297,973	10-30-2012	Hirsch et al.	
		US-	8,529,256	09-10-2013	Hirsch et al.	
		US-	8,535,056	09-17-2013	Dragan et al.	
		US-	8,745,802	06-10-2014	Steur	

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		Number-Kind Code²(If known)				
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		US-	9,084,656	07-21-2015	Hirsch	
		US-	9,089,389	07-28-2015	Hirsch et al.	
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		US-	9,526,597	12-27-2016	Steur	
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		US-	9,968,341	05-15-2018	Ritter	
		US-	10,390,734	08-27-2019	Johnson et al.	
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		US-	11,160,644	11-02-2021	Glen et al.	
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		US-	11,576,764	02-14-2023	Nguyen	
		US-	11,589,969	02-28-2023	Nguyen	
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		US-	2001/0008752	07-19-2001	Hirsch et al.	
		US-	2002/0082544	06-27-2002	Thrash et al.	
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		US-	2005/0214713	09-29-2005	O'Neill	
		US-	2006/0063126	03-23-2006	Aloise et al.	
		US-	2006/0063129	03-23-2006	Hirsch	

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		Number-Kind Code ² (If known)				
		US-	2006/0084031	04-20-2006	Hirsch et al.	
		US-	2008/0166684	07-10-2008	Kanas	
		US-	2008/0318183	12-25-2008	Suzman	
		US-	2009/0117506	05-07-2009	Igari	
		US-	2009/0123886	05-14-2009	Vaska	
		US-	2009/0208898	08-20-2009	Kaplan	
		US-	2009/0274991	11-05-2009	Black et al.	
		US-	2010/0062397	03-11-2010	Brewer	
		US-	2011/0207076	08-25-2011	Hirsch et al.	
		US-	2011/0311942	12-22-2011	Black et al.	
		US-	2012/0015317	01-19-2012	Milo	
		US-	2012/0015320	01-19-2012	Koo	
		US-	2012/0077144	03-29-2012	Fougere et al.	
		US-	2012/0115102	05-10-2012	Chen	
		US-	2012/0219926	08-30-2012	Sullivan et al.	
		US-	2012/0237894	09-20-2012	Maycher et al.	
		US-	2013/0055513	03-07-2013	Meadows et al.	
		US-	2013/0081217	04-04-2013	Jeong	
		US-	2013/0095450	04-18-2013	Ames	
		US-	2013/0252193	09-26-2013	Bowman et al.	
		US-	2014/0004478	01-02-2014	Hirsch et al.	
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		US-	2014/0212837	07-31-2014	Nguyen	
		US-	2014/0212838	07-31-2014	Nguyen	
		US-	2014/0212839	07-31-2014	Nguyen	
		US-	2014/0212840	07-31-2014	Nguyen	
		US-	2014/0212841	07-31-2014	Nguyen	
		US-	2014/0272761	09-18-2014	Lowe et al.	
		US-	2014/0349249	11-27-2014	Reyes	

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		Number-Kind Code ² (If known)				
		US-	2015/0305842	10-29-2015	Hirsch et al.	
		US-	2015/0335409	11-26-2015	Hirsch	
		US-	2016/0270892	09-22-2016	Yoo	
		US-	2017/0056143	03-02-2017	Hyun	
		US-	2017/0156831	06-08-2017	Reyes	
		US-	2017/0156832	06-08-2017	Reyes	
		US-	2017/0156833	06-08-2017	Reyes	
		US-	2018/0153637	06-07-2018	Al-Shawi et al.	
		US-	2018/0368957	12-27-2018	Hyun	
		US-	2020/0155284	05-21-2020	Baker	
		US-	2020/0178680	06-11-2020	Van Dijk	
		US-	2020/0253369	08-13-2020	De Gentile et al.	
		US-	2020/0352680	11-12-2020	Nguyen	
		US-	2020/0383560	12-10-2020	Day	
		US-	2021/0204923	07-08-2021	Ritter	
		US-	2022/0087799	03-24-2022	Glen et al.	
		US-	2022/0378563	12-01-2022	Cao et al.	
		US-	2023/0338124	10-26-2023	Nguyen et al.	
		US-	2023/0363747	11-16-2023	Ritter	
		US-	2024/0024072	01-25-2024	Nguyen et al.	
		US-	2024/0115366	04-11-2024	Rosenberg et al.	

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Examiner Initials*	Cite No.¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code³ Number⁴ Kind Codes (if known)				
		BR 112021022474 A2	01-04-2022	DRYSHIELD, LLC		

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		CA 2,851,861	06-09-2015	Incept, Inc.		
		CA 3,139,689	11-19-2020	Dryshield, LLC		
		CN 102026587	04-20-2011	Dentozone Co. Ltd.		
		CN 102247140	11-23-2011	Third Hospital Xinxiang Medical		
		CN 104490483	04-08-2015	Huanghua Kangtian Medical		
		CN 105578986A	05-11-2016	Incept, Inc.		
		CN 114302667 A	04-08-2022	DRYSHIELD, LLC		
		EP 2903557	08-12-2015	Incept, Inc.		
		EP 3184076	06-28-2017	Incept, Inc.		
		EP 3965637 (corresponds to	03-16-2022	Dryshield, LLC		
		FR 2992161	12-27-2013	Braud Vincent		
		GB 2 170 106	07-30-1986	Liegner		
		JP 2017-518859	07-13-2017	INNERLITE, INC.		
		JP 2022-533276	07-21-2022	Dryshield, LLC		
		KR 100654392	12-06-2006	Kim Jae Soo		
		KR 20220103035 A	07-21-2022	DRYSHIELD, LLC		
		MX 2021013694 A	04-07-2022	DRYSHIELD, LLC		
		TW 202108088	03-01-2021	Dryshield, LLC		
		WO 1999/037238	07-29-1999	Ohguchi		
		WO 2000/42939	07-27-2000	Michael Engeron		
		WO 00/61031	10-19-2000	William Costello		
		WO 2011/014952	02-10-2011	University of Manitoba		
		WO 2015/088577	06-18-2015	Incept, Inc.		
		WO 2018/126150	07-05-2018	NOVO DENT LLC		
		WO 2020/231864	11-19-2020	Dryshield, LLC		

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NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Dryshield brochure. Dryshield.com. Publish date: May 2019. Retrieval date: 15 September 2021. Retrieved from internet: https://dryshield.com/ds/Brochure_May2019.pdf (Year: 2019)	
		"Dryshield (single-use) vs. Zryis/Isolite (single-use) mouthpieces" posted by Mark Frias, RDH. Youtube. Posting date: 18 January 2020. Retrieval date: 15 September 2021. Retrieved from internet: https://www.youtube.com/watch?v=uKX9XahOEY (Year: 2020)	
		"Dryshield Presentation (Learn all about Dryshield)" posted by Dryshield isolation System. Youtube. Posting date: 27 October 2014. Retrieval date: 15 September 2021. Retrieved from internet: https://www.youtube.com/watch?v=fcbpz3ixvis (Year: 2014)	
		"Dryshield Tutorial - Maximize Your Dryshield Experience" posted by Dryshield Isolation System. Youtube. Posting date: 15 April 2015. Retrieval date: 15 September 2021. Retrieved from internet: https://www.youtube.com/watch?v=L2OSYPS8Rc4 (Year: 2015)	
		PCT Application No. PCT/US2014/032892, International Preliminary Report on Patentability dated 6/14/16	
		PCT Application No. PCT/US2014/032892, International Search Report and Written Opinion dated 9/4/14	
		PCT Application No. PCT/US2020/032228, International Preliminary Report on Patentability dated 11/16/21	
		PCT Application No. PCT/US2020/032228, International Search Report and Written Opinion dated 8/12/20	
		Australian Application No. 2014202637, AU Examination Report dated 1/23/15	
		Brazilian Application No. BR1120140116377, Preliminary Office Action 1/7/20	
		Canadian Application No. 2,919,142, CA Examination Report dated 5/31/16	
		Chinese Application No. 201480039991.2, First Office Action dated 12/29/16	

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	9	of	14	Attorney Docket No.	INCEP-001COH

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No'	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Columbian Application No. NC2021/0016591, First Substantive Examination dated 1/30/24	
		European Application No. 14721736.8, Extended European Search Report dated 10/20/15	
		European Application No. 17150671.0, Extended European Search Report dated 5/29/17	
		European Application No. 20804801.7, Extended European Search Report dated 4/20/23	
		European Application No. 20804801.7, Supplementary European Search Report dated 5/10/23	
		Indian Application No. 202117051466, Examination Report dated 11/9/23	
		Japanese Application No. 2022-514453, Non-Final Notification of Reasons for Refusal dated 1/30/24 (INCEP-005JP)	
		Japanese Application No. 2022-514453, Final Notification of Reasons for Refusal dated 6/25/24	
		New Zealand Application No. 782154, Examination Report dated 1/5/24	
		New Zealand Application No. 782154, Examination Report dated 7/2/24	
		Singaporean Application No. 11202112319Y, Search Report and Written Opinion dated 12/21/23	
		Singaporean Application No. 11202112319Y, Examination Report dated 6/29/24	
		Docket No. INCEP-001, U.S. Application 14/100,323, Final Office Action mailed 10/24/14	
		Docket No. INCEP-001, U.S. Application 14/100,323, Office Action mailed 5/6/14	

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Sheet	10	of	14	Attorney Docket No.	INCEP-001COH

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		Docket No. INCEP-001COA, U.S. Application 14/228,046, Office Action mailed 10/6/21	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Final Office Action mailed 11/27/20	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Office Action mailed 1/10/20	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Final Office Action mailed 7/15/19	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Office Action mailed 10/5/18	
		Docket No. INCEP-001COA, U.S. Application 14/228,046, Final Office Action mailed 1/16/18	
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		Docket No. INCEP-001COA, U.S. Application 14/228,046, Office Action mailed 11/6/15	
		Docket No. INCEP-001COB, U.S. Application 14/228,050, Office Action mailed 11/4/16	
		Docket No. INCEP-001COB, U.S. Application 14/228,050, Final Office Action mailed 5/20/16	
		Docket No. INCEP-001COB, U.S. Application 14/228,050, Office Action mailed 11/6/15	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 1/3/22	

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				Application No.	Not Yet Assigned
				Filing Date	Herewith
				First Named Inventor	Thien Nguyen
				Art Unit	Not Yet Assigned
				Examiner Name	Not Yet Assigned
Sheet	11	of	14	Attorney Docket No.	INCEP-001COH

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		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 1/13/20	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 8/8/19	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 11/29/18	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Final Office Action mailed 11/2/17	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 4/24/17	
		Docket No. INCEP-001COC, U.S. Application 14/228,054, Office Action mailed 12/3/15	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 1/5/23	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 9/2/22	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 11/12/21	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 5/5/21	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Final Office Action mailed 5/19/20	
		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 10/7/19	

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				First Named Inventor	Thien Nguyen
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Sheet	12	of	14	Attorney Docket No.	INCEP-001COH

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		Docket No. INCEP-001COD, U.S. Application 14/228,057, Office Action mailed 11/20/15	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 12/8/21	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 4/29/21	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 11/27/20	
		Docket No. INCEP-001COE, U.S. Application 14/228,061, Final Office Action mailed 1/10/20	
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		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 10/4/18	
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		Docket No. INCEP-001COE, U.S. Application 14/228,061, Office Action mailed 4/12/17	

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		Docket No. INCEP-002DCOA, U.S. Application 29/491,367, Final Office Action mailed 3/4/15	
		Docket No. INCEP-002DCOA, U.S. Application 29/491,367, Office Action mailed 11/14/14	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Final Office Action mailed 6/1/16	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Office Action mailed 11/27/15	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Final Office Action mailed 5/1/15	
		Docket No. INCEP-003DCOA, U.S. Application 29/477,887, Office Action mailed 11/14/14	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 3/21/17	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Final Office Action mailed 6/1/16	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 12/2/15	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Final Office Action mailed 5/1/15	
		Docket No. INCEP-004DCOA, U.S. Application 29/477,888, Office Action mailed 11/14/14	
		Docket No. INCEP-005, U.S. Application 16/870,745, Office Action mailed 2/17/23	

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		Docket No. INCEP-005, U.S. Application 16/870,745, Office Action mailed 12/3/21	
		Docket No. INCEP-005COA, U.S. Application 18/376,309, Office Action mailed 7/1/24	
		Docket No. INCEP-006D, U.S. Application 29/782,645, Office Action mailed 10/4/21	
		Docket No. INCEP-008D, U.S. Application 29/782,638, Office Action mailed 10/4/21	
		Docket No. INCEP-009D, U.S. Application 29/782,644, Final Office Action mailed 5/11/22	
		Docket No. INCEP-009D, U.S. Application 29/782,644, Office Action mailed 10/4/21	
		Docket No. INCEP-010D, U.S. Application 29/782,643, Final Office Action mailed 5/11/22	
		Docket No. INCEP-010D, U.S. Application 29/782,643, Office Action mailed 10/4/21	
		Docket No. INCEP-011D, U.S. Application 29/893,986, Ex Parte Quayle mailed 8/15/2023	
		Docket No. INCEP-001COF, U.S. Application 18/217,304, Office Action mailed 9/29/2023	

/MIRAYDA A APONTE/

11/07/2024

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				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
				Examiner Name	Mirayda Arlene Aponte
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US- 12,011,329	06-18-2024	Nguyen et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				

NON PATENT LITERATURE DOCUMENTS			
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		Mexican Application No. MX/a/2021/013694, Official Action dated 10/2/24	
		New Zealand Application No. 782154, Examination Report dated 10/9/24	
		Docket No. INCEP-012D, U.S. Application 29/950,233, Ex Parte Quayle Action dated 9/19/24	

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L143	37	(Artificial Intelligence) More like doc: US-20200352680-A1 Text: (AU-2020274979-A1 OR EP-3965637-A1 OR WO-2020231864-A1 OR CA-3139689-A1 OR US-11826217-B2 OR US-20240024072-A1 OR KR-20220103035-A OR US-20140212837- A1 OR TW-202108088- A OR CN-114302667-A OR US-9788924-B2 OR US-20140212841-A1 OR AU-2014202637-B2 OR WO-2015088577- A1 OR EP-2903557-A1 OR AU-2014202637-A1 OR US-20140162209- A1 OR AU- 2014202637-C1 OR US-8911232-B2 OR AU-2016200275- A1).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/31 02:47 PM
L144	33	(Artificial Intelligence) More like doc: US-20140162209-A1 Text: (AU-2014202637-A1 OR EP-2903557-A1 OR WO-2015088577-A1 OR US-20140212839- A1 OR US- 20140212837-A1 OR US-20140212838-A1 OR US-20140212841- A1 OR CA-2919142-A1 OR AU-2014202637-B2 OR US-20140212840- A1 OR CA-2851861-C OR CA-2851861-A1 OR US-8911232-B2 OR US-9788924-B2 OR CA-2919142-C OR AU- 2016200275-A1 OR US-11744686-B2 OR US-11576764-B2 OR US-11589970-B2 OR US-11589969-B2).did.	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/10/31 02:49 PM
L145	34	(Artificial Intelligence)	(US-PGPUB; USPAT;	OR	ON	ON	2024/10/31

		More like doc: CA-2851861-A1 Text: (AU-2014202637-B2 OR CA-2851861-C OR US-8911232-B2 OR AU-2014202637-A1 OR EP-2903557-A1 OR WO-2015088577-A1 OR US-20140162209-A1 OR US-20140212837-A1 OR US-20140212839-A1 OR US-20140212841-A1 OR CA-2919142-A1 OR US-20140212838-A1 OR EP-2903557-B1 OR US-9788924-B2 OR US-20140212840-A1 OR CA-2919142-C OR AU-2016200275-A1 OR US-11576764-B2 OR US-11589970-B2 OR US-11744686-B2).did.	USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO, NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB)				02:50 PM
L146	219739	cardboard AND corrugated	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/06 02:19 PM
L147	117391	cardboard AND corrugated AND box	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/06 02:19 PM
L148	96252	box AND cardboard	(US-PGPUB; USPAT;	OR	ON	ON	2024/11/06

		WITH corrugated	USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				02:20 PM
L149	7537	box AND cardboard WITH corrugated SAME force	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/06 02:20 PM
L150	75	box AND cardboard WITH corrugated SAME force SAME compressing	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/06 02:20 PM
L151	42	(Artificial Intelligence) More like doc: <u>JP-S63158813-U</u> Text: (JP-S61147711-U OR JP-2007230627-A OR JP-2019131284-A OR JP-3078854-U OR JP-2022519840-A OR JP-2010018297-A OR JP-	(US-PGPUB; USPAT; USOCR; FIT (AU, AP, AT, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, OA, RU, SU, WO, MC, MD, MY, NL, NO,	OR	ON	ON	2024/11/06 02:23 PM

L152	2	5892824-B2 OR JP-2005126109-A OR JP-2010023884-A OR JP-WO2020179350-A1 OR JP-3635265-B2 OR JP-2023150453-A OR JP-2022080664-A OR JP-H08324543-A OR JP-S58125407-A OR JP-S629213-Y2 OR JP-3002613-U OR JP-2005200092-A OR DE-20215639-U1 OR JP-2009214891-A).did. ("12011329").did.	NZ, PH, PL, PT, RO, RS, SE, SG, SI, SK, TH, TN, TR, TW, UA, VN); FPRS; EPO; JPO; DERWENT; IBM_TDB) (US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/07 08:44 AM
L153	393	(US-0004478-\$ US-0008752-\$ US-0015317-\$ US-0015320-\$ US-0016591-\$ US-0024072-\$ US-0033468-\$ US-0055513-\$ US-0056143-\$ US-0062397-\$ US-0063126-\$ US-0063129-\$ US-0077144-\$ US-0081217-\$ US-0082544-\$ US-0084031-\$ US-0087799-\$ US-0095450-\$ US-0115102-\$ US-0115366-\$ US-0117506-\$ US-0123886-\$ US-0134253-\$ US-0153637-\$ US-0155284-\$ US-0156831-\$ US-0156832-\$ US-	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/07 08:53 AM

		0156833-\$ US- 0162209-\$ US- 0166684-\$ US- 0178680-\$ US- 0204923-\$ US- 0207076-\$ US- 0208898-\$ US- 0212837-\$ US- 0212838-\$ US- 0212839-\$ US- 0212840-\$ US- 0212841-\$ US- 0214713-\$ US- 0219926-\$ US- 0237894-\$ US- 0252193-\$ US- 0253369-\$ US- 0270892-\$ US- 0272761-\$ US- 0274991-\$ US- 0305842-\$ US- 0311942-\$ US- 0318183-\$ US- 0335409-\$ US- 0338124-\$ US- 0349249-\$ US- 0352680-\$ US- 0363747-\$ US- 0368957-\$ US- 0378563-\$ US- 0383560-\$ US- 1471207-\$ US- 1731322-\$ US- 10390734-\$ US- 10390916-\$ US- 10575976-\$ US- 10869541-\$ US- 10939979-\$ US- 10945593-\$ US- 11160644-\$ US- 11191624-\$ US- 11576764-\$ US- 11589969-\$ US- 11589970-\$ US- 11737739-\$ US- 11744686-\$ US- 11793617-\$ US- 11826217-\$ US- 14721736-\$ US- 17150671-\$ US- 2019612-\$ US- 2919142-\$ US- 2937445-\$ US- 20010008752-\$ US- 20020082544-\$ US- 20030134253-\$ US- 20040033468-\$ US- 20050214713-\$ US-					
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		20060063126-\$ US- 20060063129-\$ US- 20060084031-\$ US- 20080166684-\$ US- 20080318183-\$ US- 20090117506-\$ US- 20090123886-\$ US- 20090208898-\$ US- 20090274991-\$ US- 20100062397-\$ US- 20110207076-\$ US- 20110311942-\$ US- 20120015317-\$ US- 20120015320-\$ US- 20120077144-\$ US- 20120115102-\$ US- 20120219926-\$ US- 20120237894-\$ US- 20130055513-\$ US- 20130081217-\$ US- 20130095450-\$ US- 20130252193-\$ US- 20140004478-\$ US- 20140162209-\$ US- 20140212837-\$ US- 20140212838-\$ US- 20140212839-\$ US- 20140212840-\$ US- 20140212841-\$ US- 20140272761-\$ US- 20140349249-\$ US- 20150305842-\$ US- 20150335409-\$ US- 20160270892-\$ US- 20170056143-\$ US- 20170156831-\$ US- 20170156832-\$ US- 20170156833-\$ US- 20180153637-\$ US- 20180368957-\$ US- 20200155284-\$ US- 20200178680-\$ US- 20200253369-\$ US- 20200352680-\$ US- 20200383560-\$ US- 20210204923-\$ US- 20220087799-\$ US- 20220378563-\$ US- 20230338124-\$ US- 20230363747-\$ US- 20240024072-\$ US- 20240115366-\$ US- 20804801-\$ US- 3090122-\$ US- 3379192-\$ US- 3453735-\$ US- 3489141-\$ US- 3516160-\$ US-					
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		3758950-\$ US- 3768477-\$ US- 3802081-\$ US- 3857181-\$ US- 3877691-\$ US- 4017975-\$ US- 4083115-\$ US- 4237574-\$ US- 4975057-\$ US- 5009595-\$ US- 5037298-\$ US- 5365624-\$ US- 5460524-\$ US- 5588836-\$ US- 5720275-\$ US- 5730599-\$ US- 5762496-\$ US- 5890899-\$ US- 6022214-\$ US- 6213772-\$ US- 6223376-\$ US- 6241521-\$ US- 6267591-\$ US- 6338627-\$ US- 6575746-\$ US- 6652276-\$ US- 6655960-\$ US- 6672305-\$ US- 6716029-\$ US- 6908308-\$ US- 6974321-\$ US- 7287981-\$ US- 7293990-\$ US- 7611354-\$ US- 7748981-\$ US- 8029280-\$).DID. OR (CA-2851861-\$ CA- 3139689-\$ CN- 102026587-\$ CN- 102247140-\$ CN- 104490483-\$ CN- 105578986-\$ CN- 114302667-\$ EP- 2903557-\$ EP- 3184076-\$ EP- 3965637-\$ FR- 2992161-\$ GB- 2170106-\$ JP- 2017518859-\$ JP- 2022533276-\$ KR- 100654392-\$ KR- 20220103035-\$ MX- 2021013694-\$ NC- 20210016591-\$ TW- 202108088-\$ VA- 223131450-\$ WO- 0061031-\$ WO- 1999037238-\$ WO-					
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L154	2	200042939-\$ WO- 2011014952-\$ WO- 2015088577-\$ WO- 2018126150-\$ WO- 2020231864-\$).DID. ("112021022474").did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/07 10:10 AM
L155	225	("2851861" "3139689" "102026587" "102247140" "104490483" "105578986" "114302667" "2903557" "3184076" "2992161" "2170106" "2017518859" "2022533276" "100654392" "20220103035" "2021013694" "202108088" "1999037238" "200042939" "2001031" "2011014952" "2015088577" "2018126150" "2020231864").did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/07 10:14 AM
L156	4	("20060063129").did.	(US-PGPUB; USPAT; USOCR; FIT (AP, AT, AU, BE, BG, BR, BY, CA, CH, CN, CS, CU, CZ, DD, DE, DK, EA, EE, EP, ES, FI, FR, GB, HR, HU, ID, IE, IL, IS, IT, JP, KR, LT, LU, LV, MA, MC, MD, MY, NL, NO, NZ, OA, PH, PL, PT, RO, RS, RU, SE, SG, SI, SK, SU, TH, TN, TR, TW, UA, VN, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/08 08:14 AM

L157	13897	(A61C17/08 OR A61C17/0208 OR A61C17/06 OR A61C17/00 OR A61C17/02 OR A61C17/43 OR A61C17/046).cpc. OR (433/91-93,140).ccls. AND mouthpiece AND vacuum	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/11 09:13 AM
L158	15039	(A61C17/08 OR A61C17/0208 OR A61C17/06 OR A61C17/00 OR A61C17/02 OR A61C17/43 OR A61C17/046).cpc. OR (433/91-93,140).ccls.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/11 09:13 AM
L159	4	L125 AND (mouthpiece device) AND (wave ondulat*) AND vacuum	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2024/11/11 09:14 AM

PE2E SEARCH - Search History (Interference)

There are no Interference searches to show.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
138718	7590	11/21/2024	EXAMINER	
Polsinelli LLP			APONTE, MIRAYDA ARLENE	
PO Box 140310			ART UNIT	PAPER NUMBER
Kansas City, MO 64114-0310			3772	
			NOTIFICATION DATE	DELIVERY MODE
			11/21/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocketing@polsinelli.com
sfpatent@polsinelli.com

Office Action Summary	Application No. 18/823,885	Applicant(s) Nguyen et al.	
	Examiner MIRAYDA A APONTE	Art Unit 3772	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 4 September 2024.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on ____.

2a) ☐ This action is **FINAL**.

2b) ☒ This action is non-final.

3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.

4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☒ Claim(s) 1-28 is/are pending in the application.

5a) Of the above claim(s) ____ is/are withdrawn from consideration.

6) ☐ Claim(s) ____ is/are allowed.

7) ☒ Claim(s) 1-28 is/are rejected.

8) ☐ Claim(s) ____ is/are objected to.

9) ☐ Claim(s) ____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10) ☒ The specification is objected to by the Examiner.

11) ☒ The drawing(s) filed on 4 September 2024 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some** c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. ____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

3) ☐ Interview Summary (PTO-413)

Paper No(s)/Mail Date ____.

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b)

4) ☐ Other: ____.

Paper No(s)/Mail Date ____.

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Priority

2. Applicant's claim for the benefit of a prior-filed application under 35 U.S.C. 119(e) or under 35 U.S.C. 120, 121, 365(c), or 386(c) is acknowledged. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 112 (a), by not including in the parent application no. 14/100323, now US Patent no. 8911232, the claimed subject matter of "second wall further including a wave-like structure having a plurality of crests extending toward the first wall and a plurality of troughs", specifically that said "second wall" includes said "wave-like structure" described in **claims 1, 11 and 20**, is not found in the parent application. In **claim 13** describes that each of the first plurality of perforation and the second plurality of perforations includes at least five perforations, where the number of perforations is not found in the parent application. Furthermore, in **claims 10 and 18** describes that the stability bar does not contact the second wall, also is not found in the parent application. Therefore, the claims include new subject matter into the present application, in this way the claims 1-28 do not receive the priority date of the parent application.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: the reference number **320** of **Fig. 3A** is not found.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The abstract of the disclosure is objected to because of the use of legal phraseology, e.g., comprise. Correction is required. See MPEP § 608.01(b).

5. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The "second wall further including a wave-like structure having a plurality of crests" of **claims 1, 11, and 20**, in this way indicating that the "wave-like structure" is part of the "second wall", is not found in the specification. The limitation of a "generally tubular conduit" in claims 1, 11 is not found in the specification. **Claim 13** describes that each of the first plurality of perforation and the second plurality of perforations include at least five perforations, where the number of perforations is not

found in the specification. Furthermore, **claims 10 and 18** describe that the stability bar does not contact the second wall, in which it is not found in the specification.

Claim Rejections - 35 USC § 112(a)

6. The following is a quotation of the first paragraph of 35 U.S.C. 112(a):

(a) IN GENERAL.—The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor or joint inventor of carrying out the invention.

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. **Claims 1-28** are rejected under 35 U.S.C. 112(a) or 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claims contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for applications subject to pre-AIA 35 U.S.C. 112, the inventors, at the time the application was filed, had possession of the claimed invention.

8. **Regarding claim 1, 11 and 20**, the description of “second wall further including a wave-like structure” is not found in the parent application no. 14/100323.

9. **Regarding claims 10 and 18**, the description that the stability bar does not contact the second wall, is not found in the parent application no. 14/100323.

10. **Regarding claim 13**, the description that each of the first plurality of perforation and the second plurality of perforations includes at least five perforations, is not found in the parent application no. 14/100323.

Claim Rejections - 35 USC § 112(b)

11. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. **Claims 1-19 and 28** are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor (or for applications subject to pre-AIA 35 U.S.C. 112, the applicant), regards as the invention.

13. **Regarding Claims 1 and 11**, the use of the word “generally” in the limitation “generally tubular conduit” in line 29, is confusing. When using the term “generally” in the limitation indicates that there is a degree in which the tubular shape is not tubular from the definition of “long, round, and hollow like tube” (see in the Oxford Languages dictionary). It is not understood how off of a tubular shape is intended for the conduit.

14. **Regarding claims 8 and 16**, the description of “a stability bar located along a center of the first wall” in line 1, is confusing. It is not understood what center the applicant refers to, e.g., aligned with the longitudinal axis, aligned with the center of the isolation mouth piece, etc. For examination purposes, the term “center” will be interpreted as the center that is aligned with a longitudinal axis of the isolation mouth piece.

15. **Regarding claims 8 and 16**, the description of “at least one of the first plurality of perforations being positioned on one side of the stability bar and at least one of the second plurality of perforations being positioned on another side of the stability bar” in line 2-5, is confusing. The first and the second plurality of perforations have been defined in claim 1 to be on the second wall, but claim 8 is describing that the perforations are positioned on each side of the stability bar, by been interpreted that the perforations are on the stability bar, not on the second wall, the language makes the claim indefinite.

16. **Regarding claim 28**, the use of the term “perforations” in line 1, is confusing. It is not understood if the term refers to the “plurality of perforations” in line 10 of claim 20. For examination purposes, the term will be interpreted as both terms refer to the same limitation.

Claim Objections

17. **Claim 1-19** are objected to because of the following informalities: the claims use the term “mouthpiece” and “isolation mouthpiece”. The Office understands that the both terms refer to the same limitation. Therefore, it is suggested to maintain the same nomenclature across the claims to avoid potential confusion. Appropriate correction is required.

Conclusion

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIRAYDA ARLENE APONTE whose telephone number is (571)270-1933. The examiner can normally be reached M-F 8-5.

19. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

20. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

21. Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MIRAYDA A APONTE/
Examiner, Art Unit 3772

/RALPH A LEWIS/
Primary Examiner, Art Unit 3772



United States Patent and Trademark Office

Office of the Commissioner for Patents

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You recently received an Office action from your examiner. Review of your patent application is under way! You can continue to advertise or mark any products covered by your application for your invention as "Patent Pending" for as long as this application is pending. This letter provides information about how to continue through the patent application process and the help available to you on your journey.

Where are you in the patent application process? Your patent application is now in step 3, Application Prosecution (www.uspto.gov/UtilityPatentGuide.) Though the Office action includes a "rejection," that does not mean that you don't have a good idea you can patent. It means your examiner believes your application is not yet ready for allowance.

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Have questions about the Office action? Contact your examiner! A conversation with your examiner (called an "interview") may help clarify and resolve any issues and possibly identify what you can patent. While an interview does not stop the clock for your official response or substitute for a response, there is no fee for an interview. To schedule a call or video, you can:

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Vaishali Udupa
Commissioner for Patents
United States Patent and Trademark Office

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

Applicants hereby declare, pursuant to 37 C.F.R. §1.97(e)(2), that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after having made a reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of the information disclosure statement.

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POLSINELLI LLP

Dated: December 16, 2024

By: /Joanna Chen/
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UNITED STATES
PATENT AND TRADEMARK OFFICEP.O. Box 1450
Alexandria, VA 22313 - 1450
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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885RECEIPT DATE / TIME
12/17/2024 02:21:49 PM Z ETATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 68394924

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien NguyenCORRESPONDENCE
ADDRESS -

AUTHORIZED BY Joanna Chen

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - IDS Transmittal 197E2.pdf	2	Transmittal Letter	72 KB
INCEP-001COH - IDS 1449 197E2.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	153 KB

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DOCUMENT	MESSAGE DIGEST(SHA-512)
INCEP-001COH - IDS Transmittal 197E2.pdf	7B38D7171C7209A6560AEF4A09E1E221C6531AC3A960A0882 3A9D6468A1A8033BA79607118281D915147621140B335A659D

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INCEP-001COH - IDS 1449
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7E71B0791EB36D71C64C3BED6EC5B0

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If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
Examiner Name	Mirayda Arlene Aponte				
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)				
		US-	12,167,948	12-17-2024	Nguyen et al.	
		US-	2024/0398527	12-05-2024	Nguyen et al.	

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No. ¹	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)					

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²

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¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

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Dental mouthpiece

Abstract

A dental mouthpiece is provided 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion. In an embodiment, the main body portion, cheek retractor portion, and suction connector portion may be molded in one piece, preferably by injection molding. The main body portion has an anterior wall inside the curve and a posterior wall outside the curve, and an at least one connector connecting the anterior wall and the posterior wall. The main body portion has an anterior intervening wall and the posterior intervening wall in between the anterior and posterior walls. The anterior intervening wall and the posterior intervening walls have alternating crests and troughs.

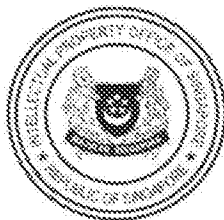


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THE PATENTS ACT 1994
CERTIFICATE ISSUED UNDER SECTION 35

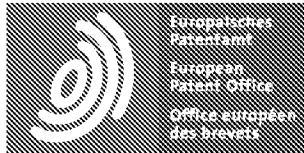
I HEREBY CERTIFY that under the provisions of the Patents Act, a patent has been granted in respect of an invention having the following particulars:

TITLE	: DENTAL MOUTHPIECE
APPLICATION NUMBER / PATENT NUMBER	: 11202112319Y
DATE OF FILING	: 08 MAY 2020
PRIORITY DATA	: 10 MAY 2019 - PATENT APPLICATION NO. 62/846,353(UNITED STATES OF AMERICA)
NAME OF INVENTOR (S)	: NGUYEN, THIEN; PHAM, TAM, THANH; NGUYEN, ETHAN; NGUYEN, LAUREN
NAME(S) AND ADDRESS(ES) OF PROPRIETOR(S) OF PATENT	: DRYSHIELD, LLC 11230 GRACE AVENUE, SUITE B FOUNTAIN VALLEY, CA 92708 UNITED STATES OF AMERICA
DATE OF GRANT	: 15 OCTOBER 2024

DATED THIS 15TH DAY OF OCTOBER 2024



Mrs. Rena Lee
Registrar of Patents
Singapore



Espacenet

CN108366851A IMPROVED ORAL CAVITY SUCTION DEVICE

Applicants: REYES HARI MARK

Inventors: REYES HARI MARK

Classifications:

IPC **A61C17/10;**CPC **A61C17/06 (GB); A61C17/08 (EP,GB,US); A61C5/90 (EP,US);**

Priorities: US201562263867P 2015-12-07; US2016061599W 2016-11-11; US201615146567A 2016-05-04; US201615265707A 2016-09-14

Application: CN201680067389A 2016-11-11

Publication: CN108366851A 2018-08-03

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IMPROVED ORAL CAVITY SUCTION DEVICE

Abstract

The invention provides a disposable saliva ejector, which utilizes a single planar, double leaf shaped plate design, embossed on inner leaf faces with a series of arced ribs, folded about its midpoint. A tab and slot arrangement joins the plates about the center. The distal tips are held together by raised pad dovetail arrangements at the distal tips of each plate. Distal and proximal tips are held in operational contact by the suction forces through the device. The ribs form perimeter channels. A trough that runs along the linear axis of both the plates directs sucked fluid and debris through the channels into a suction tube. Mouth placement is along cheek interior, clearing oral cavity viewing obstructions. A discharge tube wraps around the oral commissure, hooking onto the outer cheek. Once the device is properly placed within the patient's mouth the dental assistant is relieved from providing suction during various procedures.



(12)发明专利申请



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(72)发明人 哈利·马克·瑞伊斯

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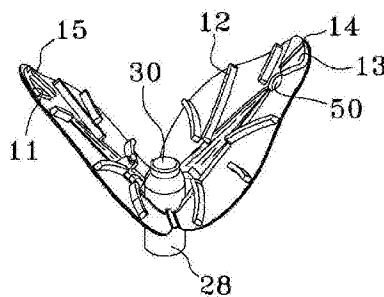
权利要求书2页 说明书4页 附图4页

(54)发明名称

改良的口腔抽吸装置

(57)摘要

本发明提供一种一次性使用的排唾液器,其利用单个平面的、双叶形板设计,在内叶面上浮凸起一系列围绕其中间点折叠的弧形肋条。突片和槽口布置围绕中心接合所述板。远端尖端由在每个板的所述远端尖端处的凸起垫鸠尾楔形布置组合在一起。远端和近端经由通过装置的抽吸力而保持操作性接触。所述肋条形成周界通道。沿着所述两个板的线性轴延行的槽引导吸液和残渣通过所述通道进入抽吸管中。在口部的布置是沿着脸颊内部,清除口腔内的可见障碍物。排放管环绕着口腔接合处,连接到外颊上。一旦所述装置正确放置在患者的口中,就能免去需要牙科助手在各种手术过程中进行抽吸工作。



1. 一种排唾液器,其特征是包括:

第一总体和第二总体上平面的板,其具有远端、近端、内面、外面以及相同形状的周界边缘;

设置在所述板之间并且位于邻近所述近端的抽吸连接管,所述连接管具有真空连接端和唾液进入端;

形成于所述排唾液器的所述内面上的一系列压印,以便当所述平面的板连在一起并且放置呈间隔开的平行镜面成像配置时在所述板之间形成一系列唾液流动通道。

2. 根据权利要求1所述的排唾液器,其中所述平面的板铰接地连接。

3. 根据权利要求1所述的排唾液器,进一步包括在操作上连接于所述板的所述近端之间的铰接部。

4. 根据权利要求2所述的排唾液器,其中所述板是卵形。

5. 根据权利要求1所述的排唾液器,进一步包括:

从所述第一板的所述远端延伸的第一凸起垫,所述第一垫具有形成于其上的可接合槽;以及,

从所述第二板的所述远端延伸的第二凸起垫,所述第二垫具有形成于其上的可接合突片,所述可接合突片被配置成用于与所述可接合槽接合。

6. 根据权利要求5所述的排唾液器,其中所述可接合突片和所述可接合槽具有鸠尾楔形配置。

7. 根据权利要求5所述的排唾液器,进一步包括形成于所述排唾液器的所述内面上的敞口槽,所述槽大小设定成与所述组装后的排唾液器中的所述抽吸连接管的所述唾液进入端摩擦接触。

8. 根据权利要求7所述的排唾液器,其中所述压印包含一系列弯曲的肋条,所述肋条延伸高于所述板的所述内面的第一高度。

9. 根据权利要求8所述的排唾液器,其中所述弯曲的肋条在所述敞口槽与所述周界边缘之间延伸。

10. 根据权利要求9所述的排唾液器,其中在所述组装后的排唾液器中的邻近肋条之间形成一系列唾液流动通道,所述通道在所述敞口槽与所述周界边缘之间。

11. 根据权利要求1所述的排唾液器,其中在组装后,所述板保持间隔开的平行配置,其间具有所述压印。

12. 一种排唾液器,其特征是包括:

第一叶形内板和第二叶形颊板,其各自具有远端、近端、内面、外面以及相同形状的周界边缘;

抽吸连接管,其具有通常从所述连接管的相对侧延伸的一对角板,所述连接管具有真空连接端和唾液进入端,其中所述第一叶形板的所述近端铰接地附连到所述角板的第一侧,并且所述第二叶形板的所述近端铰接地附连到所述角板的第二侧;

形成于所述排唾液器的所述内面上的凸起肋条图案,其中所述第一叶上的所述肋条图案和所述第二叶上的所述压印图案是不相同的图案;

沿着所述板的线性中心线形成的凹槽,所述凹槽尺寸设定成容纳所述连接管的所述唾液进入端;

形成于所述第一板上的第一垫,其具有形成于其上的可接合槽,所述可接合槽被配置成用于与形成于所述第二板上的可接合突片配合接合;

其中可以通过将所述第一板和所述第二板围绕所述角板折叠以将所述板放置呈平行的、间隔开的配置来组装所述排唾液器,其中在邻近肋条之间形成一系列敞口通道,所述通道围绕所述周界边缘相等地间隔开。

13.根据权利要求12所述的排唾液器,其中所述第一叶形板小于所述第二叶形板。

改良的口腔抽吸装置

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[0002] 此专利文献的公开的一部分包含受著作权保护的材料。著作权所有者不反对任何人传真复制所述专利文献或专利公开在专利与商标局的文件或记录中出现的内容,但其它方面保留全部著作权,无论什么权利。

[0003] 先前的申请案

[0004] 本专利是2016年5月4日提交的发明名称为“改良的口腔抽吸装置 (IMPROVED ORAL CAVITY SUCTION DEVICE)”的待决美国实用专利申请案第S/N 15/146567号的部分延续案,并以全文引用的方式将其并入本文中。本专利还要求2015年12月7日提交的同一标题的美国临时专利案第62/263867号的优先权。

技术领域

[0005] 本公开大体上涉及一种口腔抽吸装置,且更具体地说,涉及一种牙科排唾液装置。

背景技术

[0006] 口腔抽吸装置,又称为排唾液器,是牙科保健专业人员在牙科手术过程中用来去除唾液、水和残渣的狭窄的真空管。通常,排唾液器将在牙科手术过程中“搁置”在患者的口中以不断除去口中多余的唾液、水和残渣从而便于不间断牙科保健专业人员的工作。排唾液器的管通常由柔软的塑料制成,其壁内嵌有金属丝,这样管就可以弯曲成想要的角度并保持所述角度。如果抽吸管的尖端接触到患者的口部组织,其可能抽吸组织与排唾液器的尖端接触,从而使排唾液器变得毫无用处,因为它不再去除过多的唾液、水和残渣,更不用提给患者带来了非常不适的感觉。由于这个原因,牙医在患者身上执行工作时必须总是有人辅助。

[0007] 可以在患者的口部进行管理而不需要牙医助手的一次性使用的、具成本效益的、舒适且高效的排唾液器将是牙科行业受欢迎的补充。通过以下阐述的实施例提供此类装置。

发明内容

[0008] 根据各种实施例,提供一种改良的排唾液器。

[0009] 本发明的排唾液器采用锥形的、卵形的形状而解决了上述问题。本发明的排唾液器位于沿着左侧或右侧颊黏膜,从而允许充分观察口腔。当所述装置放置在沿着颊黏膜时,它减轻了患者的自然呕吐反射,并且超出了大多数牙科手术的治疗方法。由于其具有在组装时围绕装置周界形成的大量圆弧段,而且是不可折叠的,因此在需要的地方提供持续的强大吸力场,但不会拉住患者的颊黏膜和内颊。排唾液器的细长轮廓有助于在患者的口部放置排唾液器,从而形成更有效、更温和且更舒适的排唾液器。当通过“U形”弯曲部分连接到抽吸管时,所述组合可以放置在邻近患者的脸颊外侧,剩余的管子在患者的耳朵下方向后延行,因此整个口腔抽吸系统(排唾液器、真空和抽吸管)不会挡住牙医并且几乎不需要

任何注意。

[0010] 患者可以在不移除抽吸系统的情况下方便地调整其咬合,并且通过简单地合上嘴巴来减少口中的水/唾液,由此使牙医或口腔保健员能在没有助手不断地协助抽吸的情况下工作。

[0011] 本发明的排唾液器还能在患者有舌根胶敏感性、颞下颌关节(TMJ)问题或下颌或上颌圆环面时最大程度地提高患者的舒适度;由于装置的独特几何形状以及其在口部的位置,这些区域根本不会被接触到。

[0012] 本发明的排唾液器允许简化装置的制造和组装。其允许围绕装置的轴向中心线进行平面制造和组装。简化了制造中使用的过程,并且减少了制造步骤的数量。

[0013] 在不脱离本发明的范围的情况下可以对所论述的实施例进行各种修改和添加。例如,虽然上述实施例提及特定特征,但是本发明的范围还包含具有不同的特征组合的实施例和并非包含所有上述特征的实施例。

附图说明

[0014] 可以参考本说明书的其余部分以及附图获得对具体实施例的性质和优势的进一步理解,附图中使用相似的参考标号指代类似的组件。

[0015] 图1是未组装的排唾液器的顶部透视图;

[0016] 图2是正在组装的排唾液器的前透视图;

[0017] 图3是组装后的排唾液器的前透视图;

[0018] 图4是未组装的排唾液器的顶视图;

[0019] 图5是未组装的排唾液器的右侧视图;

[0020] 图6是未组装的排唾液器的第一端视图;

[0021] 图7是未组装的排唾液器的左侧视图;

[0022] 图8是未组装的排唾液器的底视图;以及

[0023] 图9是未组装的排唾液器的第二端视图。

具体实施方式

[0024] 查看图1,可见排唾液器2是一对基本上平面的、类似叶形(卵形)板,其近端一起较接地连接成镜像配置,具有通常在板上方和下方从排唾液器的轴向中心线的中心处的切口区域延伸的短管,所述两个板在所述轴向中心线处连在一起。在组装时,通过每个卵形板的尖端处的互锁的鸠尾楔形凸起垫以及中心圆形突片和槽口,连在一起的卵形板限定允许经由抽吸/真空系统从装置排出唾液的唾液流动系统。(唾液流动系统由一系列流动通道和中心槽组成。)然而,经过仔细检查,正如本文所讨论的,可以看到此装置在结构上更加复杂。

[0025] 排唾液器2具有独特的几何结构,其可以总体上描述为卵形(即,具有比顶端更宽的底部,本文中也称为叶子形状),因此每个板具有两个不同的区域,即其主体1以及其前叶3(图8)。这些区域组合称为叶形板。每个板都是由均匀厚度的医用级聚合物构成的柔性的、总体平面的部件。

[0026] 排唾液器2由第一叶形内板4和略微更大的第二叶形颊板6组成。(如所指示,在使用中,内板4面向患者的口部中线,且颊板6面向患者的脸颊。)这两个板的周边边缘16遵循

相同的轮廓,然而,这两个板的尺寸设定并不完全相同。(在替代实施例中,所述两个板的尺寸设定完全相同。)在优选实施例中,第二颊板6的尺寸设定成沿着跨装置2绘制的任何线测量大近似2mm。简单地说,第二颊板6的周界边缘延伸超出第一内板4的周界边缘近似1mm。

[0027] 每个板在其内部面8和10(图4)上装饰有一系列通常自所述内部面延伸的凸起的、弧形的肋条12。(如本文中所使用,术语肋条是指从板的内面延伸的任何凸起的突出部或压印。)在每个板的远端处有凸起垫,第一板4上的第一凸起垫11具有形成于其上的凸起的鸠尾楔形突片15,其以配合方式符合形成于第二板6上的第二凸起垫13中的鸠尾楔形槽口14。这些鸠尾楔形组件的对准和配合有助于当折叠并组装后保持两个板4和6在其尖端处连接。在替代实施例中,可能存在沿着第二板6上的第二凸起垫13切出的至少一个另外的槽口,以便允许当装置2插入患者的口部时从装置2的最前尖端抽吸聚集的唾液。

[0028] 在替代实施例中,已知可以使用其它机械或化学方法来连接突片,例如胶合、焊接、固定、卷曲、槽口和突片配置等,这在所属领域是众所周知的。

[0029] 肋条12中的每一个具有相同的高度和宽度。凸起垫的顶面(不包括鸠尾楔形突片15)从板的内部面延伸近似仅肋条12所延伸的高度的二分之一。凸起垫用于限定第一通道的深度和宽度,并且在装置应用抽吸时阻止尖端自身坍塌。

[0030] 沿着每个板的线性中心线形成相同的槽18。槽18是内部面(图1、2和4)上敞口渐窄凹槽,其在外表面32和34(图3、5、6、7、8和9)上具有凸起的脊线20。凹槽中的锥度在板的近端处开始,并沿着线性中心线延伸,但是在每个板的远端处的凸起垫之前终止。槽的宽度和深度都逐渐减小,从近端到远端在这些维度上逐渐减小。每个板的近端具有以板的线性中心线为中心的切口22。

[0031] 两个叶形板的近端在从圆形连接管26的相对侧相隔180度延伸的一对三角形的角板支撑件24(图5、6、7、8和9)上铰接地连在一起。角板支撑件24从由接合的切口22形成的空隙的轴向中心线垂直延伸。换句话说,角板支撑件24沿着每一个板的远端形成。这也是未组装的装置的轴向中心线。当呈未组装的排唾液器2时,角板支撑件24中的每一个的平面垂直于板的平面而存在。当装置组装后,角板支撑件的平面处于彼此平行但不共线,并且两个板的线性轴在所有三个平面上都平行。角板支撑件24的厚度近似肋条的高度。板附接到角板支撑件24的相对侧。

[0032] 存在穿过第一颊板4形成的抽吸孔口50(邻近板的远端处的凸起垫14,如图1、2、3、4和8中所示)。此抽吸孔口50与形成于板上的槽18的末端重合。当排唾液器2连接到抽吸装置并且沿着患者口内的颊黏膜适当地放置时,排唾液器2的第一颊板4的内表面将面朝患者的口部的中线。以此方式,在装置的近端处将始终存在通过抽吸孔口50或第二颊板6上的垫14中的槽口52的抽吸。这是很重要的,因为装置远端的尖端是唾液在患者口中聚集之处。

[0033] 当装置2组装后,真空连接端28从圆形连接管26的外端延伸,并且渐窄的唾液进入端30从其内端延伸。真空连接端28的尺寸设定成摩擦连接到抽吸管,抽吸管在操作上连接到真空系统。结合排唾液器2,这些组件形成排唾液系统。

[0034] 在第一板4上的槽18的敞口渐窄凹槽中间是圆形突片36,其以配合方式符合第二板6上的敞口渐窄凹槽18中形成的圆形槽口38以进行摩擦固持。接合这些以及第一突片11和第二突片13上的鸠尾楔形组件以进行装置2的组装。

[0035] 当排唾液器2组装后(图2),颊板6与内板4围绕其周边边缘重叠。连接管26的唾液

进入端30部分地位于切口22内部且部分地位于第一板和第二板的内面之间的渐窄凹槽内。真空连接端28从装置的近端的线性中心线延伸。唾液端以配合方式符合敞口渐窄凹槽内的摩擦配合。由于连接管和两个板都是由柔性聚合物组成,因此当对装置应用抽吸时,这些组件在更接近的公差范围内被拉到一起。

[0036] 肋条12从其相应板的周边边缘朝向所述板的内部面上的敞口渐窄槽18成弧形。在两个不同的板上,弧形肋条12不处于相同的图案。实际上,两个板的肋条处于共生图案,因此,当装置组装后且两个板围绕角板支撑件24(其内面朝向彼此)朝内折叠以便处于间隔开的平行定向(图3)时,从装置的周边边缘16开始到槽18形成一系列邻近的弧形流动通道42。这些弧形通道42围绕组装后的排唾液器2的周边边缘40近似相等地间隔开(与肋条端44一样)。因此,排唾液器2的主体中的两个板4和6由肋条的高度支撑以防坍塌(其内部面被真空吸引成彼此接触)。排唾液器2的远端通过凸起垫14防止坍塌。这确保了装置将始终能够将唾液和残渣从通道抽吸到槽18中并且抽吸到连接管26外。

[0037] 排唾液器2的物理结构的显着特征之一是适用于简单、经济的制造。整个装置通过注塑成型柔性牙用级聚合物制成。因为在组装之前其是平放的,所以排唾液器2可以堆叠起来进行大规模的运输。

[0038] 装置2设计为介于口腔和内颊之间的口腔区域,以便不依靠牙齿来支撑。抽吸管的U型排放区段围绕口腔接合处弯曲,然后沿着脸颊的外侧。排唾液器2的位置是其功能的关键,因为口腔下部的唾液会流向喉咙。当正确放在患者口中时,排唾液器能有效清除聚集的唾液而不妨碍牙医的工作。一旦放置,排唾液器对于患者来说是舒适的,且不需要牙医助手的持续监控。两个板的不同外部尺寸可以防止患者的脸颊被吸进与通道接触。抽吸连接到抽吸装置,一旦抽吸装置启动,就会形成分散而有效的吸力场。

[0039] 无论牙齿的排列或形状如何,或即使患者有缺牙,唾液喷射器2也会得到完全的支撑,并且仍然正常工作。

[0040] 当排唾液器2连接到排唾液系统并且在患者的内颊旁边插入患者口中时,当真空启动时,患者口部的唾液和残渣从装置2的周边边缘16吸入通过弧形通道42、进入槽18、通过连接管26并且进入排唾液系统的其余部分。由于两个板中较大的第一(内)颊板6位于患者的脸颊上,因此板的周边边缘存在下降,并且所产生的真空不会让患者的脸颊接触到排唾液器的周边边缘以及通道两端而阻止唾液的流动。

[0041] 虽然本文中未示出,但是连接管26的真空连接端所连接到的抽吸管是中空的,具有近端、远端并且总体上为“U”形。抽吸管可以是可重复使用的或一次性使用的。排唾液器2正是通过这根管连接到抽吸装置(在牙科领域所熟知,因此未示出),并且通过所述管从患者口中取出唾液、水和其它残渣。

[0042] 所属领域的技术人员应了解,本公开所基于的概念可易于用作设计用于实现本发明的数个目的其它结构、方法和系统的基础。因此重要的是,在等效构造并不脱离本发明的精神和范围的情况下,权利要求书应被视为包括此类等效构造。

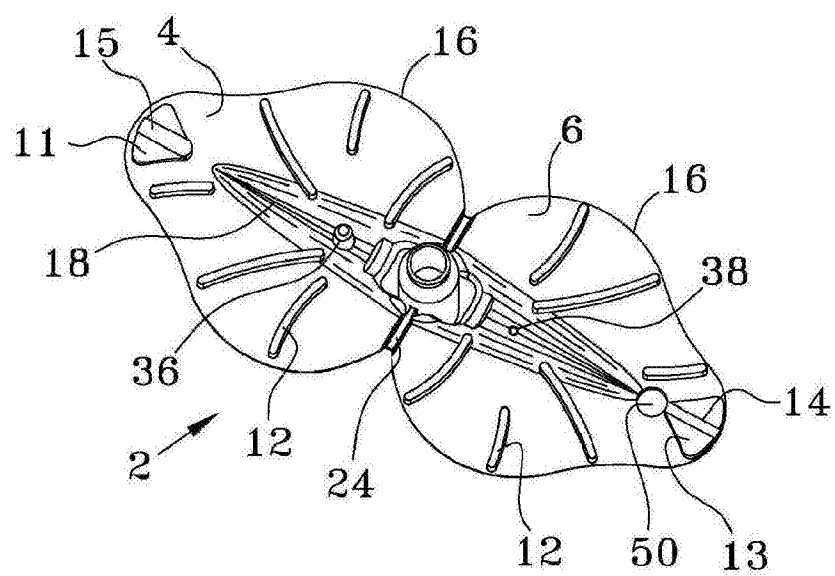


图1

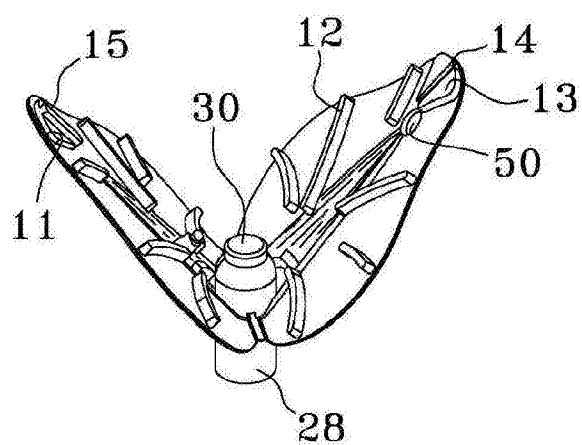


图2

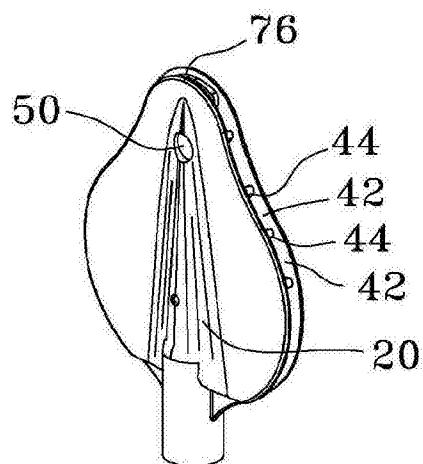


图3

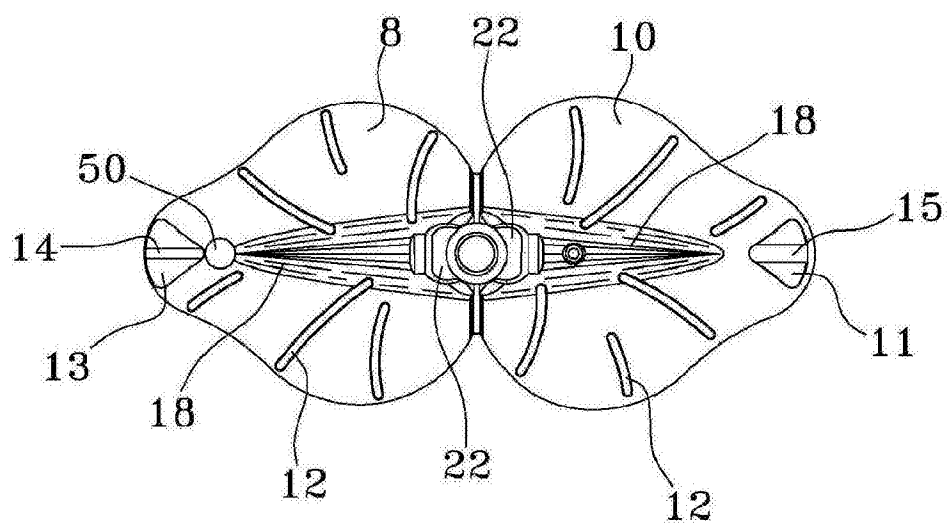


图4

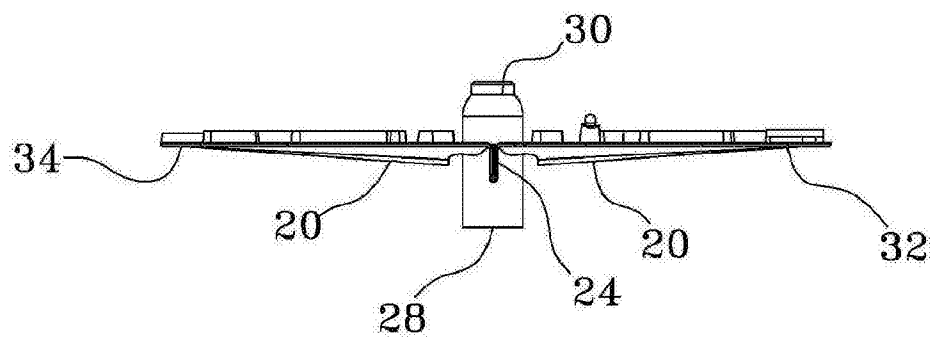


图5

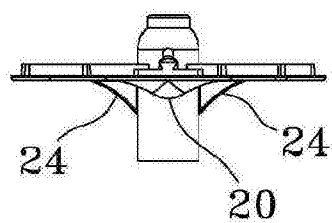


图6

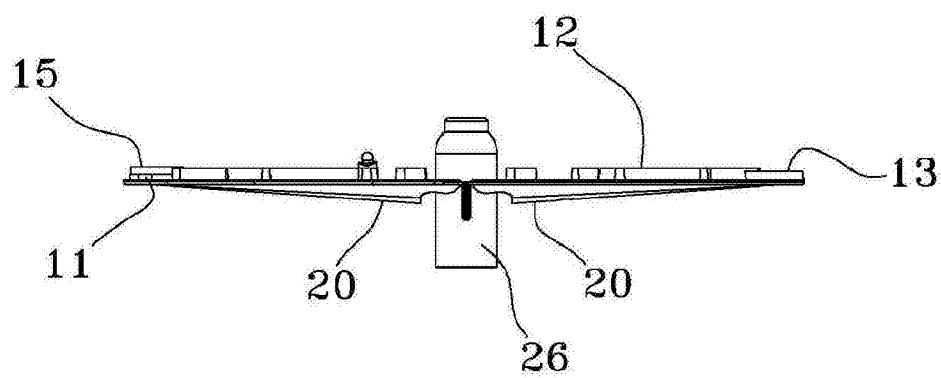


图7

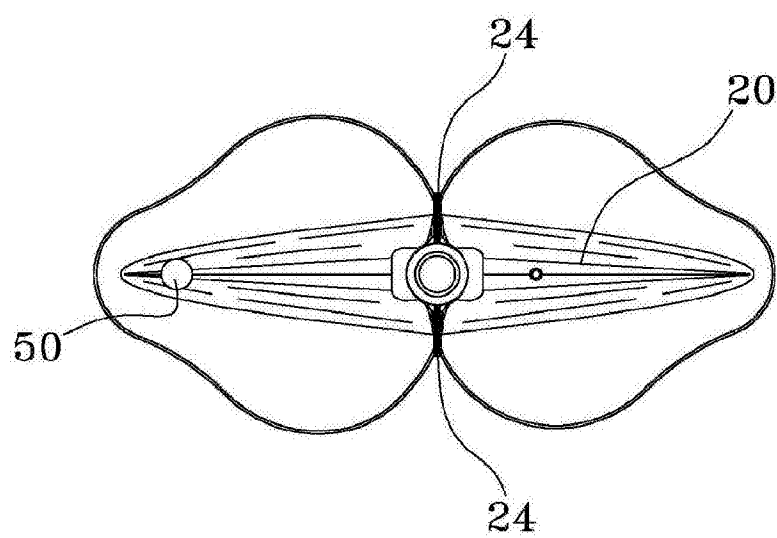


图8

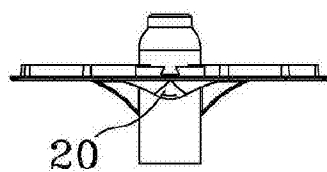


图9

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				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
Examiner Name	Mirayda Arlene Aponte				
Attorney Docket No.	INCEP-001COH				
Sheet	1	of	1		

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Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
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		Country Code ³ Number ⁴ Kind Codes (if known)				
		CN 108366851A	08-03-2018	Reyes Hari Mark		
		SG 11202112319Y	10-15-2024	DRYSHIELD, LLC		

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APPLICATION #
18/823,885

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INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 68394881

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY Joanna Chen

Documents

TOTAL DOCUMENTS: 6

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - IDS Transmittal 197E1.pdf	2	Transmittal Letter	71 KB
INCEP-001COH - IDS 1449 197E1.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	164 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
FOR_SG11202112319Y.pdf	2	Foreign Reference	281 KB
FOR_CN108366851.pdf	12	Foreign Reference	1393 KB
NPL_INCEP-005CN_First Office Action 10-28-2024.pdf	24	Non Patent Literature	12871 KB
INCEP-001COH - List of Copinging Apps.pdf	2	Information Disclosure Statement (IDS) Form (SB08)	82 KB

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DOCUMENT	MESSAGE DIGEST(SHA-512)
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NPL_INCEP-005CN_First Office Action 10-28-2024.pdf	E33AB035CB7441C53DB2218DB243074CD2FCDDFA1EE06FC 48A9ECE3824D5E25C2D3C13F900ED505EA100954408A92878 88C8E961B436EF0E03F45F659133AF81
INCEP-001COH - List of Copen ding Apps.pdf	5C7854664745FE2C76F18869EF78ECE5274C507F6A1A59FEA 71C26E8BA614F977F59C0FFA895FF73B0BE3732686C148AE0 D88A99458EDAB8353EC169A67B83B4

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New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

**List of Co-Pending Patents or Patent Applications That May Be Directed Towards Similar
Subject Matter**

Examiner's Initials	Application No.	Country Code	Docket No.	First- Named Inventor	Title	Filing Date
	18/983,258	US	INCEP-005COB	Thien Nguyen	DENTAL MOUTHPIECE	12/16/2024
	2020274979	AU	INCEP-005AU	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	BR1120210224742	BR	INCEP-005BR	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	202117051466	IN	INCEP-005IN	Thien Nguyen	DENTAL MOUTHPIECE	11/10/2021
	MX/a/2021/013694	MX	INCEP-005MX	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	782154	NZ	INCEP-005NZ	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	29/950,233	US	INCEP-012D	Thien Nguyen	MOUTHPIECE	7/1/2024

	29/950,231	US	INCEP-013D	Thien Nguyen	MOUTHPIECE MOUTH PROP	7/1/2024
Examiner's Signature:						Date:

Respectfully submitted,
POLSINELLI LLP

Dated: December 16, 2024

By: /Joanna Chen/
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SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

Applicants hereby declare, pursuant to 37 C.F.R. §1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POLSINELLI LLP

Dated: December 16, 2024

By: /Joanna Chen/
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NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be viewed using the USPTO's publicly available Searchable Databases via the Patent Public Search tool at www.uspto.gov. The direct link to access the Patent Public Search tool is currently <https://ppubs.uspto.gov/pubwebapp/static/pages/ppubsbasic.html>.

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Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



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INTRAORAL DEVICE

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FILED BY Heather Armstrong

PATENT CENTER # 69081476

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CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY TAM THANH PHAM

Documents

TOTAL DOCUMENTS: 5

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - IDS Transmittal.pdf	2	Assertion regarding Information Disclosure Statement (IDS) Size Fee (SB/08C)	72 KB
INCEP-001COH - IDS 1449.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	164 KB

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FOR_EP3965637B1.pdf	21	Foreign Reference	573 KB
NPL_INCEP- 005AU_Examination Report 1-20-2025.pdf	4	Non Patent Literature	105 KB
FOR_JP7617081B2.pdf	21	Foreign Reference	2190 KB

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FOR_EP3965637B1.pdf	ACF4D0D63578EE0FC1C2EF63C14EB8611BBD996265640FC9 92FF657D8EF828F473EDE31588DB613D18B537E8A2AC79E41 C527C3ACA585C523185FED391BF566B
NPL_INCEP- 005AU_Examination Report 1- 20-2025.pdf	977D8F9FEC535A88F2001C157CF3CAC0EEDD29E1FA3EC1E3 51C066F880EFA5EF2B4E8E0832E4A6B1A8B6591FB97BA329F 27E71864A02537DC4556B96BC00465C
FOR_JP7617081B2.pdf	8BE26487E183FBD1A900273E71B795BC13F858726144C27DC F51EFEB14EE17504028AEE67030EF3534D7F7CEA8C8D67AB CA4DC94F0BA590D1FA4B76E3B5A5749

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(86)(22)出願日	令和2年5月8日(2020.5.8)		ドライシールド、エルエルシー
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審査請求日	令和5年2月13日(2023.2.13)		弁理士 森下 賢樹
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(32)優先日	令和1年5月10日(2019.5.10)		アメリカ合衆国、カリフォルニア州 9 2
(33)優先権主張国・地域又は機関	米国(US)		7 0 8、ファウンテン バレー、スイー
			ト ビー、グレース アベニュー 1 1 2
			3 0

最終頁に続く

(54)【発明の名称】 歯科用マウスピース

(57)【特許請求の範囲】

【請求項1】

曲線で構成された歯科用マウスピースであって、
前記曲線の中心部に位置し、第1端部および第2端部を有するメインボディ部と、
前記第1端部に接続された吸引コネクタ部と、
前記第2端部に接続された口角鉤部と、
を備え、
前記メインボディ部は、前記曲線の内側に前壁と、前記曲線の外側に後壁と、を備え、
前記前壁および前記後壁は、前記前壁と前記後壁との間の隔たりに対応する内部空間を定義し、
少なくとも1つのコネクタが、前記前壁を前記後壁に接続し、
少なくとも1つの前側中間壁が、前記前壁の縁に沿って、前記前壁と前記後壁との間を部分的にまたいで、前記後壁に向けて延び、
少なくとも1つの後側中間壁が、前記後壁の縁に沿って、前記前壁と前記後壁との間を部分的にまたいで、前記前壁に向けて延び、
前記少なくとも1つの前側中間壁は、部分的に少なくとも1つの後側中間壁に向けて延びる交代する山および谷を有し、
前記吸引コネクタ部は、前記内部空間を真空吸引源に接続することを特徴とする歯科用マウスピース。

【請求項2】

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前記吸引コネクタ部の少なくとも1つは、前記内部空間または柱の内部に、前記メインボディ部の縦方向に広がる少なくとも1つの壁を含むことを特徴とする請求項1に記載の歯科用マウスピース。

【請求項3】

前記内部空間内で前記後壁から突出する1つ以上の突出部を含むブリッジ構造をさらに備え、

この突出は、間隔を空けた山および谷を含むことを特徴とする請求項1に記載の歯科用マウスピース。

【請求項4】

前記突出部は、高さおよび長さに変化することを特徴とする請求項3に記載の歯科用マウスピース。 10

【請求項5】

前記前側中間壁および前記後側中間壁の少なくとも1つは、高さまたは大きさが変化する複数の突出部を含むことを特徴とする請求項1に記載の歯科用マウスピース。

【請求項6】

前記前側中間壁および前記後側中間壁は、前記吸引コネクタ部が前記メインボディ部と接触する場所で接触することを特徴とする請求項1に記載の歯科用マウスピース。

【請求項7】

前記前側中間壁および前記後側中間壁は、前記メインボディ部が前記口角鉤部と接触する場所で接触することを特徴とする請求項1に記載の歯科用マウスピース。 20

【請求項8】

前記吸引コネクタ部と一体化された咬合阻止器をさらに備え、
前記咬合阻止器は、患者の咬合中、さらなる圧縮抵抗および減少した圧縮性を与えることを特徴とする請求項1に記載の歯科用マウスピース。

【請求項9】

前記メインボディ部、前記吸引コネクタ部および前記口角鉤部は、単一の部品として射出成形により形成されることを特徴とする請求項1に記載の歯科用マウスピース。

【請求項10】

前記メインボディ部、前記吸引コネクタ部および前記口角鉤部を形成する材料は、柔軟で、半透明で、高耐熱で、オートクレーブ可能な、シリコンベースの材料であることを特徴とする請求項1に記載の歯科用マウスピース。 30

【請求項11】

前記後壁は、前記後壁の内側表面から、前記メインボディ部の縦軸に沿って突出する安定バーをさらに含むことを特徴とする請求項1に記載の歯科用マウスピース。

【請求項12】

前記コネクタ部の少なくとも1つは、前記安定バーに沿って等間隔に配置された複数のコネクタ部を含むことを特徴とする請求項11に記載の歯科用マウスピース。

【請求項13】

前記吸引コネクタ部は、係嵌を与えるための真空アダプタ上の突起部に対応する切り抜きを備えることを特徴とする請求項1に記載の歯科用マウスピース。 40

【請求項14】

前記吸引コネクタ部は前記真空吸引源に接続し、
前記真空吸引源の起動により、前記メインボディ部の内部空間からの流体の吸引が行われることを特徴とする請求項1に記載の歯科用マウスピース。

【請求項15】

前記真空吸引源の起動により、前記メインボディ部の外部から前記メインボディ部の内部空間内に流体を引き込むことを特徴とする請求項14に記載の歯科用マウスピース。

【請求項16】

歯科用マウスピースであって、
第1端部および第2端部を有するメインボディ部と、 50

前記メインボディ部の第1端部に接続された吸引コネクタ一部と、
前記メインボディ部の第2端部に接続された口角鉤部と、
を備え、
前記メインボディ部は、
前壁と、
前記前壁と間隔を置いて配置された後壁と、
を備え、
前記前壁と前記後壁との間の隔たりに対応する内部空間が、前記前壁と前記後壁とによって定義され、
前記メインボディ部は、 10
前記内部空間内に、前記前壁を前記後壁に接続する少なくとも1つのコネクタ一部と、
前記前壁または前記後壁の縁に沿って、前記前壁から突出して、前記前壁と前記後壁との
間を少なくとも部分的にまたいで前記後壁に延びる少なくとも1つの中間壁と、
前記メインボディ部の第2端部から延びる頸部と、
をさらに備え、
前記少なくとも1つの中間壁は、前記内部空間の隔たりの一部をまたいで延び、
前記少なくとも1つの中間壁は、部分的に前記前壁または前記後壁に向けて、異なる隔た
りを持ちつつ前記内部空間に沿って延びる複数の交代する山および谷を有し、
前記頸部の幅は、前記第1端部における前記メインボディ部の幅より狭く、
前記吸引コネクタ一部は、前記内部空間を真空吸引源に接続するように構成され、 20
前記頸部の幅は、前記口角鉤部の幅より狭く、
口角鉤部は、前記メインボディ部の第2端部から延びる頸部に接続されていることを特徴
とする歯科用マウスピース。
【請求項17】
前記少なくとも1つの中間壁は、複数の間隔を空けた部分を有することを特徴とする請求
項16に記載の歯科用マウスピース。
【請求項18】
前記吸引コネクタ部に一体化された咬合阻止器をさらに備え、
前記咬合阻止器は、患者の咬合中、圧縮抵抗を与えることを特徴とする請求項16に記載
の歯科用マウスピース。 30
【請求項19】
前記メインボディ部、前記吸引コネクタ一部および前記口角鉤部は、単一の部品として射
出成形により形成されることを特徴とする請求項16に記載の歯科用マウスピース。
【請求項20】
前記吸引コネクタ一部は、係嵌を与えるための真空アダプタ上の突起部に対応する切り抜
きを備えることを特徴とする請求項15に記載の歯科用マウスピース。
【請求項21】
前記吸引コネクタ一部は前記真空吸引源に接続し、
前記真空吸引源の起動により、前記メインボディ部の内部空間からの流体の吸引が行われ
ることを特徴とする請求項16に記載の歯科用マウスピース。 40
【請求項22】
前記真空吸引源の起動により、前記メインボディ部の外部から前記メインボディ部の内部
空間内に流体を引き込むことを特徴とする請求項21に記載の歯科用マウスピース。
【発明の詳細な説明】
【技術分野】
【0001】
【関連出願への相互参照】
本出願は、2019年5月10日出願の米国仮特許出願第62/846,353号「歯科
用マウスピース」に基づく優先権を主張する。当該仮特許出願の開示内容は、参照として
本明細書に組み込まれる。 50

【0002】

本発明は、一般に歯科用マウスピースの分野に関する。より具体的には、本発明は、口腔内歯科用吸引器および分離型マウスピースに関する。

【背景技術】

【0003】

現在歯科の分野では、歯科専門医、歯科衛生士、歯科助手などが様々なマウスピースを使用する。かつては歯科患者は、歯科専門医および歯科助手を含む従来型の2名のチームから治療を受けていた。さらに歯科治療には、多くの異なる歯科機器および材料が使われていた。こうした歯科機器および材料は、口腔内鏡、咬合阻止器、低速吸引エジェクター、高速吸引エジェクター、ガーゼ、コットンロール、ドライアングルなどを含む。こうした歯科機器のそれぞれは、異なる目的ごとに使われてもよく、歯科処置の目的に応じて組み合わせられてもよい。このように歯科処置を行う歯科専門医は、これら複数の歯科機器を使う必要があるだろう。従って歯科助手の重要な役割は、複数の異なる歯科機器および材料の使用に合わせて、歯科専門医を補助することにある。

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【発明の概要】

【発明が解決しようとする課題】

【0004】

従ってこの分野では、より効率的で、快適で、安全な歯科処置サービスの提供を可能とするシステムおよび方法が必要とされる。

【課題を解決するための手段】

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【0005】

曲線で構成された歯科用マウスピースの実施の形態が開示される。このような歯科用マウスピースは、曲線の中心部に位置し、第1端部および第2端部を有するメインボディ部と、第1端部に接続された吸引コネクタ部と、第2端部に接続された口角鉤部と、を備えてもよい。

【0006】

ある実施の形態では、メインボディ部、吸引コネクタ部および口角鉤部は、射出成形により、一体成形されてもよい。ある実施の形態では、マウスピースは、柔軟で、半透明で、射出成形に有利な、高耐熱で、オートクレーブ可能な材料で作られてもよい。このような材料は、シリコンを含んでもよい。こうしたマウスピースは、高耐熱で、オートクレーブ可能な材料で作られるので、再生可能である。

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【0007】

メインボディ部は、曲線の内側に前壁と、曲線の外側に後壁と、を備える。前壁および後壁は、内部空間を定義する。少なくとも1つのコネクタが、内部空間内で前壁を後壁に接続する。少なくとも1つの前側中間壁が、前壁から、部分的に後壁に向けて延び、少なくとも1つの後側中間壁が、後壁から、部分的に前壁に向けて延びる。少なくとも1つの前側中間壁および少なくとも1つの後側中間壁は、それぞれ、交代する山および谷を有する。

【図面の簡単な説明】

【0008】

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【図1】 歯科用マウスピースの上面図である。

【0009】

【図2】 図1の歯科用マウスピースの等角図である。

【0010】

【図3】 図1の歯科用マウスピースの後面図である。

【0011】

【図4】 図1の歯科用マウスピースの底面図である。

【0012】

【図5】 図1の歯科用マウスピースの頂部環状断面図である。

【0013】

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【図6】図1の歯科用マウスピースの側面図である。

【0014】

【図7】後壁から引き離された前壁を備える図1の歯科用マウスピースの側面図である。

【0015】

【図8】吸引コネクタとメインボディとが交差するところでの、図1の歯科用マウスピースの横断面図である。

【0016】

【図9】吸引コネクタとメインボディとが交差するところでの、図1の歯科用マウスピースの横断面図である。

【0017】

【図10】壁状コネクタを備える図1の歯科用マウスピースの縦断面図である。

【0018】

【図11】柱状コネクタを備える図1の歯科用マウスピースの縦断面図である。

【発明を実施するための形態】

【0019】

本発明の実施の形態は、高吸引歯科用アダプタに取り付け可能なマウスピースであって、椅子の横での単独のハンズフリー吸引を実現することにより歯科スタッフを援助するものを含んでもよい。このようなマウスピースは、メインボディ部と、口角鉤部と、吸引コネクタ部と、安定バーと、咬合阻止器と、を備える。いくつかの実施の形態では、メインボディ部、口角鉤部、吸引コネクタ部、安定バーおよび咬合阻止器（およびそれら的一部）が、好ましくは射出成形により、一体成形されてもよい。ある典型的な実施の形態では、マウスピースは、柔軟で、弾力があり、少なくとも半透明で、射出成形に有利な材料で作られる。このような材料は、既知の熱可塑性エラストマーを含んでもよい。

【0020】

図1は、歯科用マウスピースの上面図である。歯科用マウスピース100は、第1端部104、および第1端部104の反対側に第2端部106を持つメインボディ部102を含む。図示された実施の形態では、吸引コネクタ部108が第1端部104に結合されており、口角鉤部110が第2端部106に結合されている。しかし別の実施の形態では、マウスピース100は、吸引コネクタ部108および／または口角鉤部110を持たなくてもよい。さらに咬合阻止器101が、メインボディ部102の第1端部104の近くで吸引コネクタ部108に一体化されている。しかし咬合阻止器101は、吸引コネクタ部108のどこに配置されてもよい。

【0021】

メインボディ部102は、第2端部106から口角鉤部110に延びる頸部120を含んでもよい。頸部120は、メインボディ部102の幅、口角鉤部110の幅および吸引コネクタ部108の幅より狭い幅122を持ってもよい。しかし別の例では、幅122は、メインボディ部102の幅、口角鉤部110の幅および吸引コネクタ部108の幅より広くてもよい。

【0022】

図示された実施の形態では、吸引コネクタ部108、口角鉤部110、咬合阻止器101およびメインボディ部102は、1つの部品で構成されてもよい。しかし他の例では、吸引コネクタ部108、口角鉤部110、咬合阻止器101および／またはメインボディ部102の各々は、別個の部品で構成されてもよい。例えばいくつかの実施の形態では、メインボディ部102、口角鉤部110および吸引コネクタ部108（およびそれら的一部）が、好ましくは射出成形により、一体成形されている。咬合阻止器101は、別個の部品で構成され、吸引コネクタ部108に取り付け可能であってもよい。ある典型的な実施の形態では、マウスピース100は、柔軟で、弾力があり、少なくとも半透明で、射出成形に有利な材料で作られてもよい。このような材料は、熱可塑性エラストマーを含んでもよい。

【0023】

図2は、図1の歯科用マウスピースの等角図である。図2に示されるように、メインボディ部102は、曲線形状をしてもよい。マウスピース100は柔軟で弾力のある材料（例えば、熱可塑性エラストマー）で作られるので、患者の口内に置かれると、患者の口の形に一致するような曲線となることができる。吸引コネクタ部108は、適切に配置されたとき、患者の口の片側から突出してもよい。一方このとき、メインボディ部102は、患者の口の後部にもたれて置かれ、口角鉤部110は、患者の口と反対側の頬を圧迫する。

【0024】

口角鉤部110は、患者の頬を圧迫し、吸引コネクタ部108が延びる方と反対側で、患者の頬を患者の歯から引っ込ませるように構成されてもよい。マウスピース100を形成する材料が柔軟であるため、マウスピース100は、患者の口内に置かれるとある程度曲がる。しかしこの材料の持つ弾力性により、マウスピース100は、曲げから開放されると、患者の口の一部に圧力を加えることができる。例えばマウスピース100の材料は、口角鉤部110が、患者の頬を歯から遠ざけるのに十分な圧力で患者の頬を圧迫する程度の弾力性を持つ。口角鉤部110は、メインボディ部102に取り付けられるハンマーヘッド状の遠位領域を持つものとして図示されている。口角鉤部110は、ある例では中身の詰まったものであってもよく、別の例では空洞のあるものであってもよい。

【0025】

メインボディ部102は、曲線の内側部分に前壁112を備え、曲線の外側部分に後壁114（図4にも示される）を備えてもよい。前壁112は、患者の口の前方向に対向してもよい。後壁114は、患者の口の後方向に対向してもよい。メインボディ部102の前壁112および後壁114は、互いに平行であるように構成されてもよい。前壁112は、後壁114の所定形状に対応する所定形状をしてもよい。しかし別の例では、前壁112は、後壁114と異なる形状をしてもよい。所定形状は、第1端部104においてはより幅が広く、第2端部106においてはより幅が狭いものであってもよい。いくつかの実施の形態では、所定形状は盾状に相当するものであってもよい。しかし所定形状は、例えば、正形状、直線矢印状、長形状、星状、楕円状、円状、その他の患者の口腔形状に一般に合致するものであってもよい。大人と子供の口のサイズが異なることに対応して、異なるサイズのマウスピースが与えられてもよい。第1端部104の部分は、メインボディ部102のその他の部分より厚い壁で形成されてもよい。このような厚さを与えることにより、第1端部104においてさらなる安定性を得ることができる。前壁112および後壁114は、患者の口内に置かれると、患者の気道を封鎖することができる。このとき、咬合阻止器101は、患者の歯と歯の間に置かれる。吸引コネクタ部108は、患者の口の一方の側から延びる。口角鉤部110は、患者の口内の他方側の頬を圧迫する。

【0026】

メインボディ部102は、前壁112の上および／または後壁114の上に位置づけられた開口140を含んでもよい。このような開口140（例えば、穿孔、スリット、アパーチャ等）により、当該開口140を通して空気、液体および小さなゴミ等を、患者の口から内部空間126内に吸引し、吸引コネクタ部108を通して吸引源に送ることができる。開口140は、前壁112および／または後壁114の周辺に配置されてもよい。いくつかの例では、開口140は、前壁112および／または後壁114の頸部120のいずれかの側に配置されてもよい。別の例では、開口140は複数のアパーチャである。このとき、すべてのアパーチャが同じサイズであってもよいし、アパーチャの一部または全部が異なるサイズであってもよい。

【0027】

図3は、図1の歯科用マウスピースの後面図である。図3に示されるように、吸引コネクタ部108は、楕円状であってもよく、メインボディ部102に取り付けられてもよい。吸引コネクタ部108は、メインボディ部102より厚い壁で形成されてもよく、高吸引真空アダプタに取り付けられるように構成されてもよい。吸引コネクタ部108は、水、唾液およびゴミ等を、内部空間126から除去用外部アダプタへ送ることを補助し

てもよい。吸引コネクタ部１０８は、スライド中のマウスピースを、所望の深さのアダプタ位置で停止させるための内部ストッパを含んでもよい。

【００２８】

以下、図３に示されるように、患者の口内に置かれたとき口内の上顎にもたれる側を意味するものとして、上壁１１６という用語が使われてもよい。同様に、以下、患者の口内に置かれたときに、口内の底にもたれる側を意味するものとして、下壁１１８という用語が使われてもよい。上壁１１６および下壁１１８は、同一に形成されてもよい。この場合、マウスピースの向きを変えることができる。このとき、新しい向きにでは、上壁１１６は、下壁１１８のように見える（逆もまた同様である）。使用中、メインボディ部１０２の上壁１１６および下壁１１８は、口内の頂部、ならびに、口内の底部および／または舌を保護し分離するものとして機能してもよい。さらにメインボディ部１０２は、口内の後部（例えば、喉や気道）を、落下するゴミからを保護し分離するものとして機能してもよい。

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【００２９】

図４は、図１の歯科用マウスピースの底面図である。前壁１１２および後壁１１４は、少なくとも１つのコネクタ部１２４を用いて、互いに接続されてもよい。いくつかの実施の形態では、吸引コネクタ部１０８は、切り抜き１４２（例えば、ロゴ、長方形の切り目、正方形の切り目、円形の切り目、その他の任意の形の切り目といった形状）を有してもよい。これにより、外部の高吸引真空アダプタ上の対応する突起（これもまた、例えば、ロゴ、長方形の切り目、正方形の切り目、円形の切り目、その他の任意の形の切り目といった形状であってよい）とのさらなる連結が可能となる。

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【００３０】

咬合阻止器１０１は、咬合阻止器１０１内に空洞を形成するための咬合阻止開口１４１により補強されてもよい。これにより、咬合阻止は、一層安定的となる。ある実施の形態では、咬合阻止開口１４１は、咬合阻止器１０１の底部で開口する、２つの平行な長方形の開口であってよい。咬合阻止開口１４１は、吸引コネクタ部１０８に向けて延びているが、その延びは吸引コネクタ部１０８の厚さを越えていなくてもよい。

【００３１】

図５は、図１の歯科用マウスピースの頂部環状断面図である。図５、７および８に示されるように、メインボディ部１０２は、後壁１１４の内側表面１３５から突出するブリッジ構造１３６を含んでもよい。いくつかの実施の形態では、ブリッジ構造１３６は、ロゴの形状（例えば、矢じり状または盾状）を持つ。ブリッジ構造は、矢じりの先端にギャップを有してもよい。これにより矢じりは、頂点ではなく、開いた弧を有する。いくつかの実施の形態では、ブリッジ構造１３６は、マウスピース１００のメインボディ部１０２の中心部に配置されてもよい。いくつかの例では、こうしたブリッジ構造１３６は、ブリッジ山１３７およびブリッジ谷１３８を持つ波の形で、内側表面１３５から突出してもよい。別の実施の形態では、ブリッジ構造１３６は、胸壁または台形の形で突出してもよい。ブリッジ山１３７により、複数の接触点（これは、一般に後壁１１４から分離されている）が与えられる。図７および８に示されるように、吸引コネクタ部１０８の開口１４６の近くにあるブリッジ山１３７の高さは、開口１４６の遠くにあるブリッジ山１３７の高さより高くてもよい。図８に示されるように、吸引コネクタ部１０８の開口１４６の近くにあるブリッジ山１３７の長さは、開口１４６の遠くにあるブリッジ山１３７の長さより長くてもよい。ブリッジ谷１３８は、内側表面１３５と実質的に同じ高さか、または内側表面１３５の上方に延びていてもよい。吸引中、前壁１１２を後壁１１４から分離しておくために、ブリッジ谷１３８は前壁１１２と接触する。これにより、前壁１１２または後壁１１４が内部空間１２６内に落ち込むことが防止される。従って、ゴミおよび／または水は、内部空間１２６を通して廃棄される。一方、ブリッジ谷１３８により、ギャップが与えられる。これにより、ブリッジ構造１３６を通して、空気、流体および小さなゴミ等を吸引することができる。別の例では、ブリッジ構造１３６は滑らかであってよい。あるいはブリッジ構造１３６は、鋭利な山および鋭利な谷、円状の山および円状の谷、正方

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形の山および正方形の谷、またはこれらの形状を組み合わせた形状の山および谷を含んでもよい。

【0032】

図5および7に示されるように、メインボディ部102は、メインボディ部102のほぼ中央部から口角鉤部110に向けて延びる安定バー143をさらに含んでもよい。このような安定バー143は、後壁114の内側表面135から縦軸103に沿って突出してもよい。ある実施の形態では、安定バー143は、ブリッジ構造136の開いた弧から開始し、縦軸103に沿って頸部120の第2端部106に向けて続き、口角鉤部110に到達する前に終了する。安定バー143は、後壁114の内側表面135から、前壁112の内側表面113に向けて突出してもよい。安定バー143は、内部空間126の高さ以下の任意の高さであってもよい。ある実施の形態では、安定バー143の特定の箇所に、前壁112を後壁114に取り付けるためのコネクタ124が取り付けられてもよい。安定バー143の上のコネクタ124は、吸引中に、マウスピース100の引っ込み、安定、支持および曲げを補助してもよい。ある典型的な実施の形態では、安定バー143に位置調整された複数のコネクタ124が与えられてもよい。しかし別の例では、安定バー143は、少なくとも1つのコネクタ124に位置調整されなくてもよい。

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【0033】

図6は、図1の歯科用マウスピースの側面図である。図6は、患者の口の底にもたれる下側を示す。前壁112および後壁114は、互いに間隔を空けて配置され、内部空間126を定義する。コネクタ124、安定バー143およびブリッジ構造136のうちの少なくとも1つ以外、一般に内部空間126は開いており非閉塞である。これにより、吸引は内部空間126を通して流れることができる。前壁112と後壁114との間の内部空間126は、一般に、前壁112および後壁114と同じ所定形状を持つ。ある例では、内部空間126は、頸部120を通して延びる。しかし別の例では、内部空間126は、頸部120を通して延びない。さらに別の例では、内部空間126は、頸部120を通して、口角鉤部110まで延びる。

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【0034】

少なくとも1つの前側中間壁127が、前壁112の少なくとも1つの端部128から、部分的に後壁114に向けて延びていてもよい。前側中間壁127は、少なくとも1つの端部128から、前壁112と後壁114との間の中点に延びる厚さを持ってもよい。従って、このような前側中間壁127の全長は、前壁112と後壁114との間隔全体の長さを越えなくてもよい。このような前側中間壁127の厚さは、口角鉤部110から、頸部120を通して、第1端部104まで漸次増加していてもよい。このような厚さの増加によって、第1端部104における剛性が強化されてもよい。いくつかの実施の形態では、このような前側中間壁127は、さらにうねを立てられてもよい。別の実施の形態では、このような前側中間壁127は、滑らかな端部を持ってもよい。いくつかの例では、前側中間壁127は、交代する山130および谷132を含む。図示された実施の形態では、山130は平坦な面であり、谷132は円柱状の切り取り面である。しかし、山130および谷132は、任意の形状であってもよい。いくつかの例では、山130および谷132は、前側中間壁127の深さ全体にわたって延びる。しかし別の例では、山130および／または谷132は、前側中間壁127の一部に沿って延びてもよい。山130および谷132は、マウスピース100に、さらなる引っ込み、安定、支持および曲げを与えてもよい。

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【0035】

後壁114は、少なくとも1つの対応する中間壁134（これは、後壁114の少なくとも1つの端部133から延び、前壁112に向けて部分的に延びる）を有してもよい。後側中間壁134は、前側中間壁127と同じ強さのうねを持つ鏡像であってもよいし、前側中間壁127と異なるものであってもよい。図6に示されるように、ある例では、前側中間壁127のうねは、後側中間壁134のうねと位置調整されてもよい。組み合わせを考えると、前側中間壁127、後側中間壁134およびそれぞれの位置調整されたうねは

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、前壁１１２と後壁１１４との間に、開いた網目を形成してもよい。このような開いた網目は、第１端部１０４から第２端部１０６までの間、前壁１１２および後壁１１４の各々の端部１２８、１３３に続いてよい。前側中間壁１２７と後側中間壁１３４との間の開いた網目を設けることにより、空気、流体および小さなゴミ等を、患者の口から、この網目を通して、内部空間１２６に吸引し、さらに吸引源に向けて吸引コネクタ部１０８に送ることができる。

【００３６】

前側中間壁１２７は、第１端部１０４におけるメインボディの吸引コネクタ部１０８の近くで、上壁１１６および下壁１１８で、後側中間壁１３４に接続されてもよい。あるいは前側中間壁１２７は、第２端部１０６における口角鉤部１１０の近くで、上壁１１６および下壁１１８で、後側中間壁１３４に接続されてもよい。いくつかの実施の形態では、前側中間壁１２７は、口角鉤部１１０で、後側中間壁１３４に接続されてもよい。

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【００３７】

図７は、後壁から引き離された前壁を備える図１の歯科用マウスピースの側面図である。少なくとも１つのコネクタ１２４は、内部空間１２６内で、前壁１１２と後壁１１４との間の距離全体にわたって広がっていてもよい。言い換えれば、コネクタ１２４は、後壁１１４の内側表面１３５および前壁１１２の内側表面１１３に取り付けられてもよい。少なくとも１つのコネクタ１２４は、マウスピース１００に構造的剛性を与えてもよく、ピラー、柱、壁等であってもよい。図示された例では、少なくとも１つのこのようなコネクタ１２４は、３つのコネクタを含む。これら３つのコネクタの各々は、柱状であり、互いに直線的に分離される。

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【００３８】

図８は、図１の歯科用マウスピースの横断面図である。吸引コネクタ部１０８の開口１４６の近くにあるブリッジ山１３７の高さは、開口１４６の遠くにあるブリッジ山１３７の高さより高くてもよい。また、吸引コネクタ部１０８の開口１４６の近くにあるブリッジ山１３７の長さは、開口１４６の遠くにあるブリッジ山１３７の長さより長くてもよい。

【００３９】

図９は、図１の歯科用マウスピースの横断面図である。図９は、吸引コネクタがメインボディに取り付けられるところでの歯科用マウスピースを示す。図９に示されるように、吸引コネクタ部１０８は、楕円形をしていてよい。さらに吸引コネクタ部１０８は、メインボディ部１０２がブリッジ構造１３６（ここでは、ブリッジ山１３７およびブリッジ谷１３８が、吸引コネクタ部１０８の近くでのメインボディ部１０２の開口を部分的に遮断してもよい）に到達するまでシームレスに移動して、メインボディ部１０２に取り付けられてもよい。咬合阻止器１０１が、吸引コネクタ部１０８の開口に干渉しないように、吸引コネクタ部１０８の外側に取り付けられる。

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【００４０】

（やはり図５に示されるように）吸引コネクタ部１０８は、開口１４６を含んでもよい。開口１４６は、メインボディ部１０２の内部空間１２６内に向けて開口する。これにより、内部空間１２６と吸引コネクタ部１０８とが流体連通する。吸引コネクタ部１０８の開口の近くで、少なくとも１つの吸引コネクタ壁１４４が、前壁１１２から後壁１１４に延びてもよい。これにより、吸引中に、前壁１１２または後壁１１４が落ち込むことが防止される。少なくとも１つの吸引コネクタ壁１４４は、吸引コネクタ部１０８の開口１４６のいずれかの側に配置された１対の壁を含む。

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【００４１】

咬合阻止器１０１は、咬合阻止器１０１をより強く牽引し支持するために、咬合阻止器１０１のいずれかの側に、咬合阻止山１４７と、咬合阻止谷１４８と、を含んでもよい。ある実施の形態では、咬合阻止山１４７および咬合阻止谷１４８は、咬合阻止器１０１のいずれかの側で、ぎざぎざの形状または波の形状を取る。しかし、咬合阻止山１４７および咬合阻止谷１４８は、任意の形状を取ってもよい。

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【0042】

図10は、壁状コネクターを備える図1の歯科用マウスピースの縦断面図である。この実施の形態では、コネクター124は、縦軸103で、強固な壁として、前壁112を後壁114に接続する。コネクター124は、口角鉤部110からいくらか離れたところにある第2端部106で頸部120から、縦軸103に沿って、第1端部104に向けて延びる。そしてコネクター124は、メインボディ部102の中点を取り巻くブリッジ構造136の開口部近くで終端する。別の実施の形態では、コネクター124は、縦軸103に沿って延び、メインボディ部102の内部空間126内の任意の場所で終端する。

【0043】

図11は、柱状コネクターを備える図1の歯科用マウスピースの縦断面図である。この実施の形態では、コネクター124は、安定バー143を有する、縦軸103で等間隔で隔てられた3つの円柱状の柱として、前壁112を後壁114に接続する。第1のコネクターは、メインボディ部102に配置される。第2のコネクターは、頸部120の近くに配置される。そして第3のコネクターは、口角鉤部110の近くに隔てられる。3つのコネクターが直線的に分離されることにより、頸部120を狭い幅122に保ったまま、頸部120にさらなる剛性を持たせることができる。別の実施の形態では、このようなコネクター124は、設置されたマウスピース100が口の一方から後方を通して他方まで巻き始める場所に配置されてもよい。これにより、マウスピース100は、患者の口の一般的な口腔内形状に合致することができる。別の例では、少なくとも1つのコネクター124は、1つのコネクター、2つのコネクター、あるいは3つ以上のコネクターを含んでもよい。このとき、各コネクターは、マウスピース100の任意の場所に配置されてもよい。ある例では、少なくとも1つのコネクター124は、メインボディ部102から、頸部120を通して、口角鉤部110まで延びるリブであってもよい。

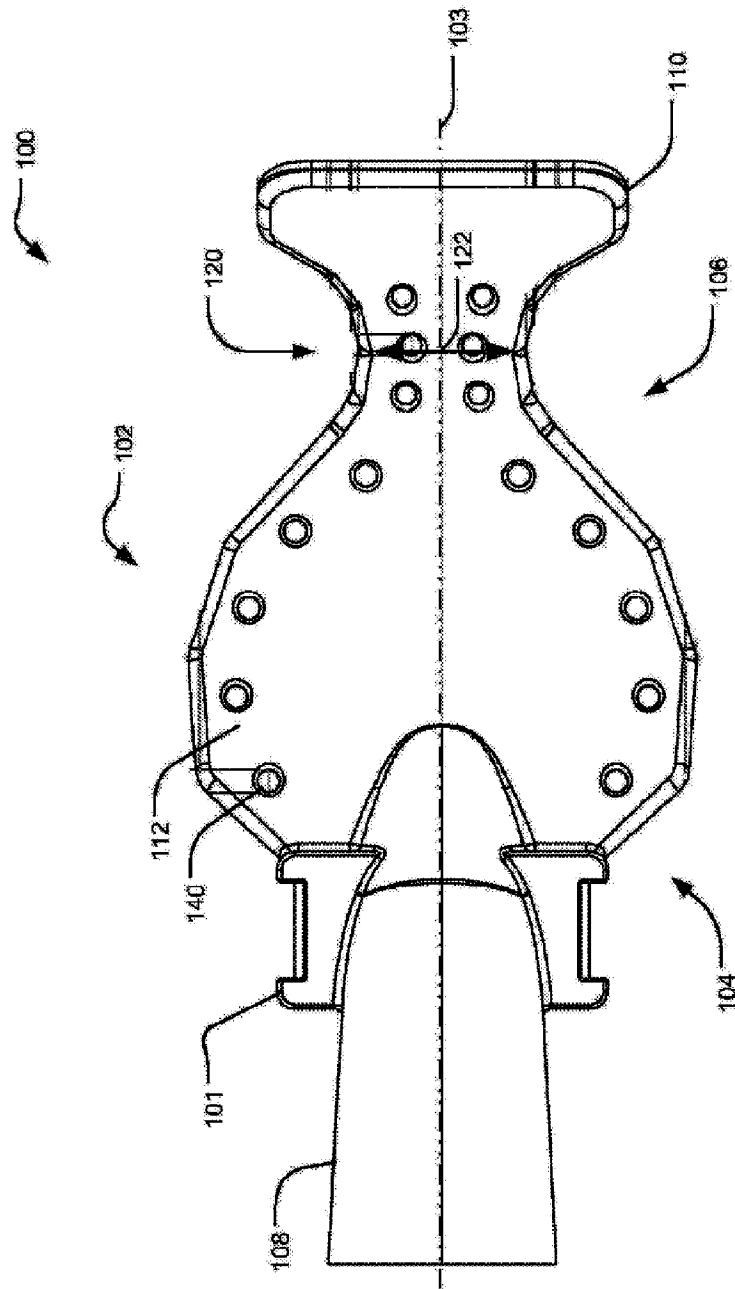
【0044】

ここで説明したマウスピースは、一体型のオートクレーブ可能な高吸引真空アダプタとともに使われてもよい。このような高吸引真空アダプタは、単一の均質な材料で作られてもよい。こうした真空アダプタは、シングルレバーのデザインを持ちながら、水、唾液およびゴミ等を口腔から吸引源に制御可能に除去できる、現行のすべての高吸引真空エバキュエーターおよび唾液エジェクターと同様に機能することができる。シングルレバーは、少なくとも部分的に囲い込まれたメインボディから、吸引コネクター内の単一かつ大型の除去導管を通して、水、唾液およびゴミ等を制御可能に除去するようにデザインされてよい。

【0045】

以上、様々な実施の形態を説明したが、これらは限定でなく例示を目的とすることに留意されたい。本明細書の説明は、本発明の範囲を特定の実施の形態に限定しない。従って、好ましい実施の形態の範囲およびスコープは、前述の典型的な実施の形態に限定されない。本明細書の説明は、模式的であり限定的ではないことに留意されたい。一方、本開示は、添付の請求項で定義されるものの他、当業者に理解可能な本発明の範囲に含まれるすべての変形、改良、均等物をカバーする。従って、本発明の範囲は、本明細書の説明によってではなく、すべての均等の範囲を含む請求項によって決定されなければならない。

【図 1】



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【図 2】

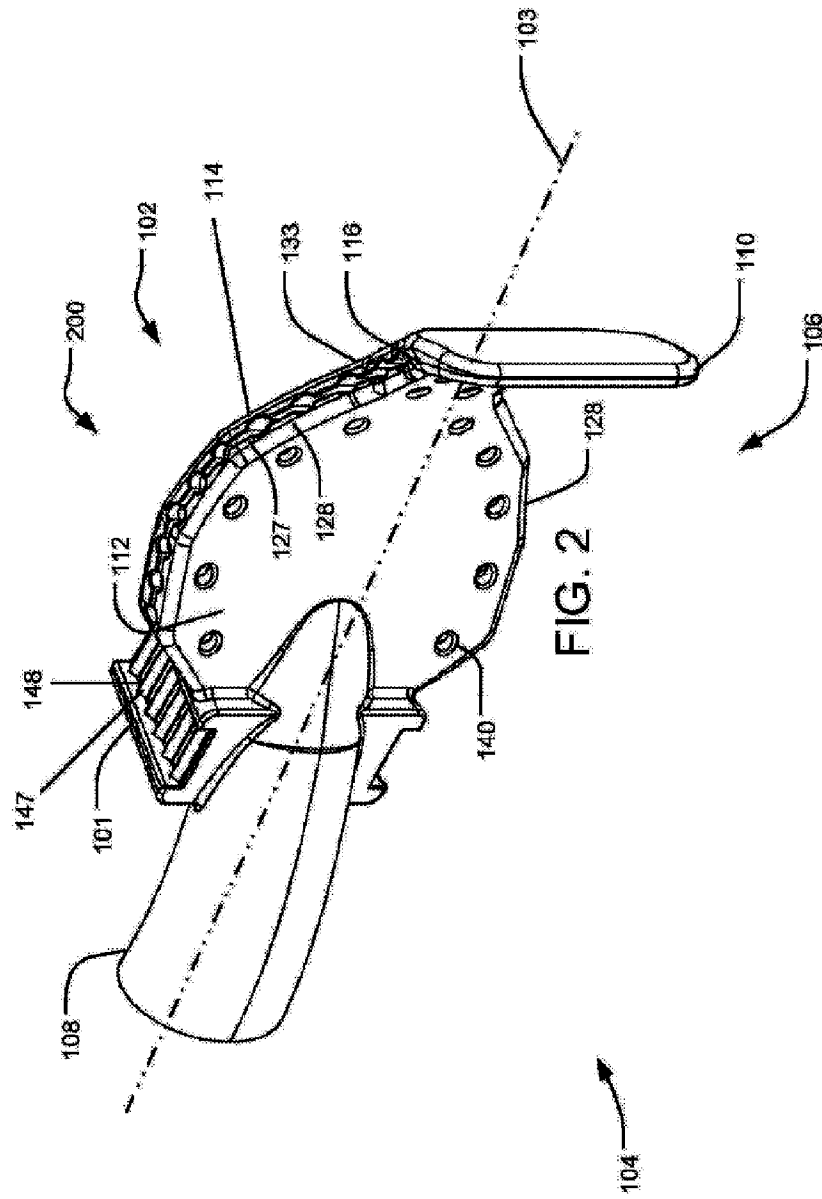


FIG. 2

【図 3】

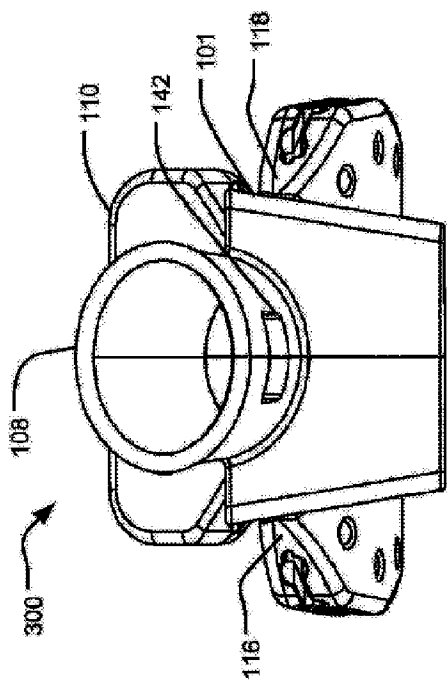


FIG. 3

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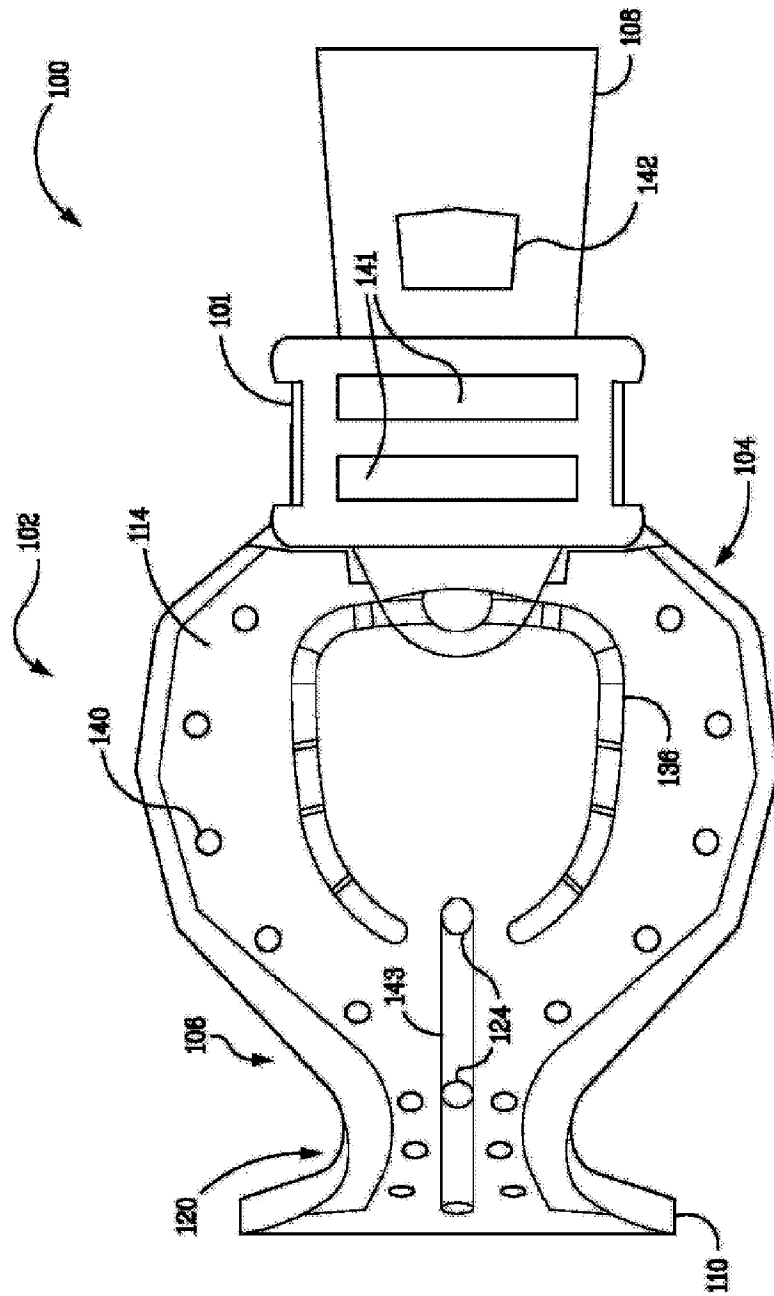
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【図 4】



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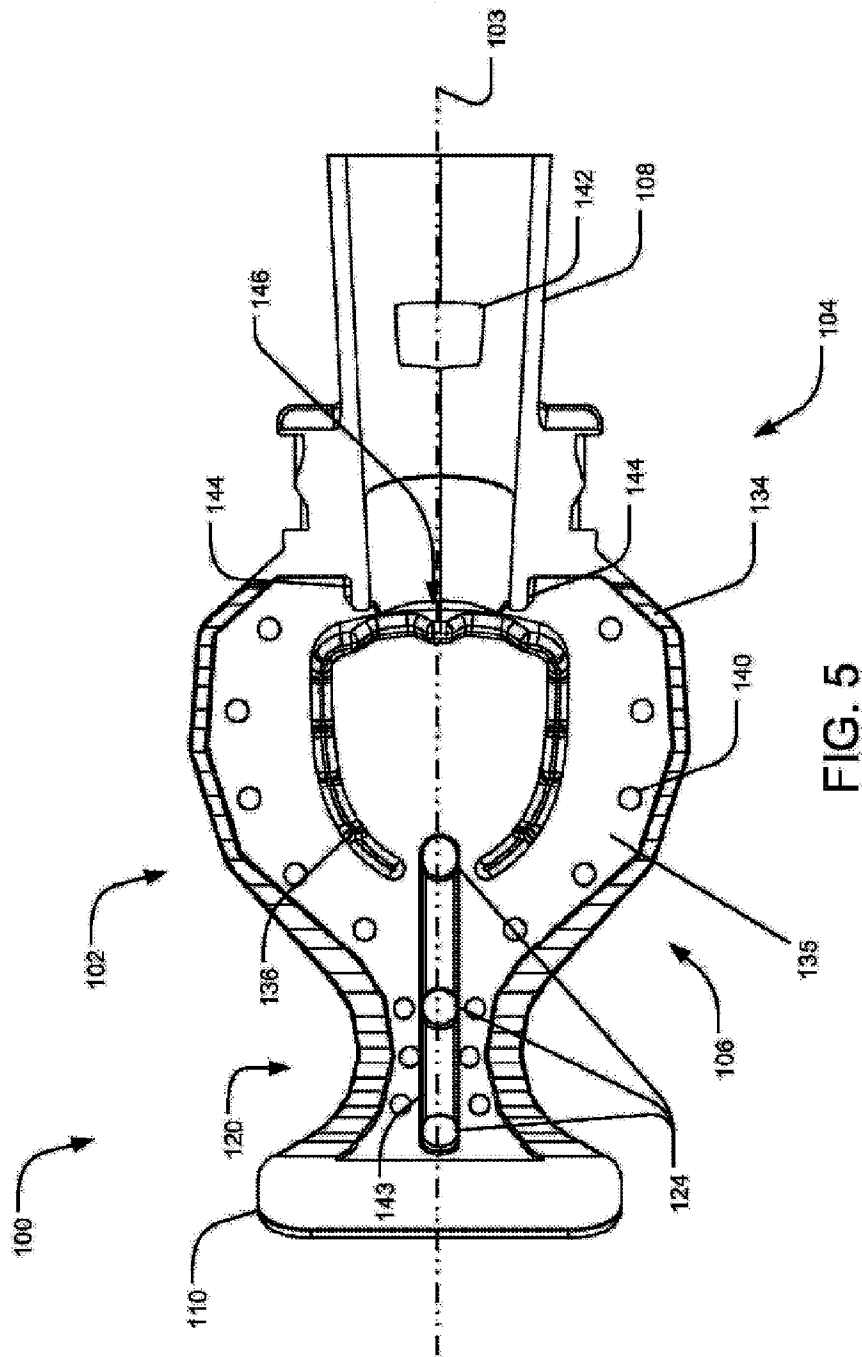
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【図 5】



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【図 6】

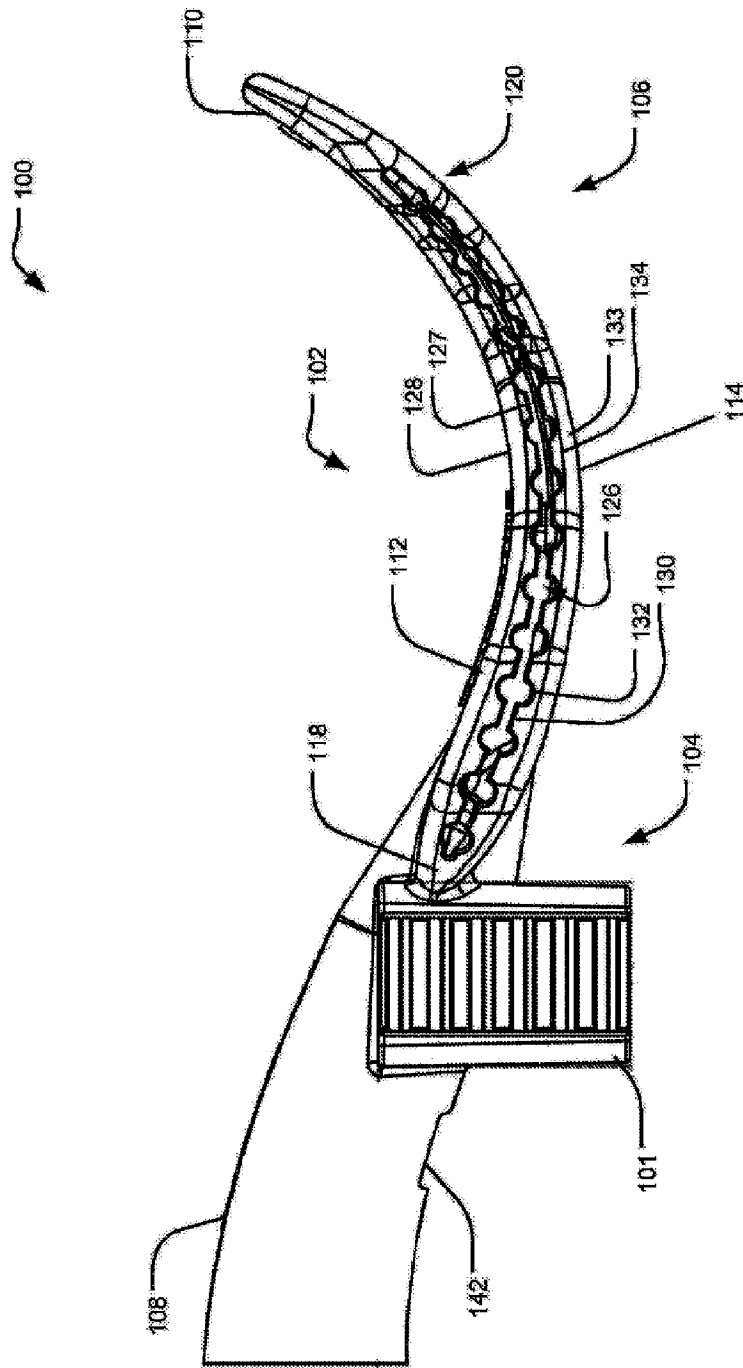


FIG. 6

【図 7】

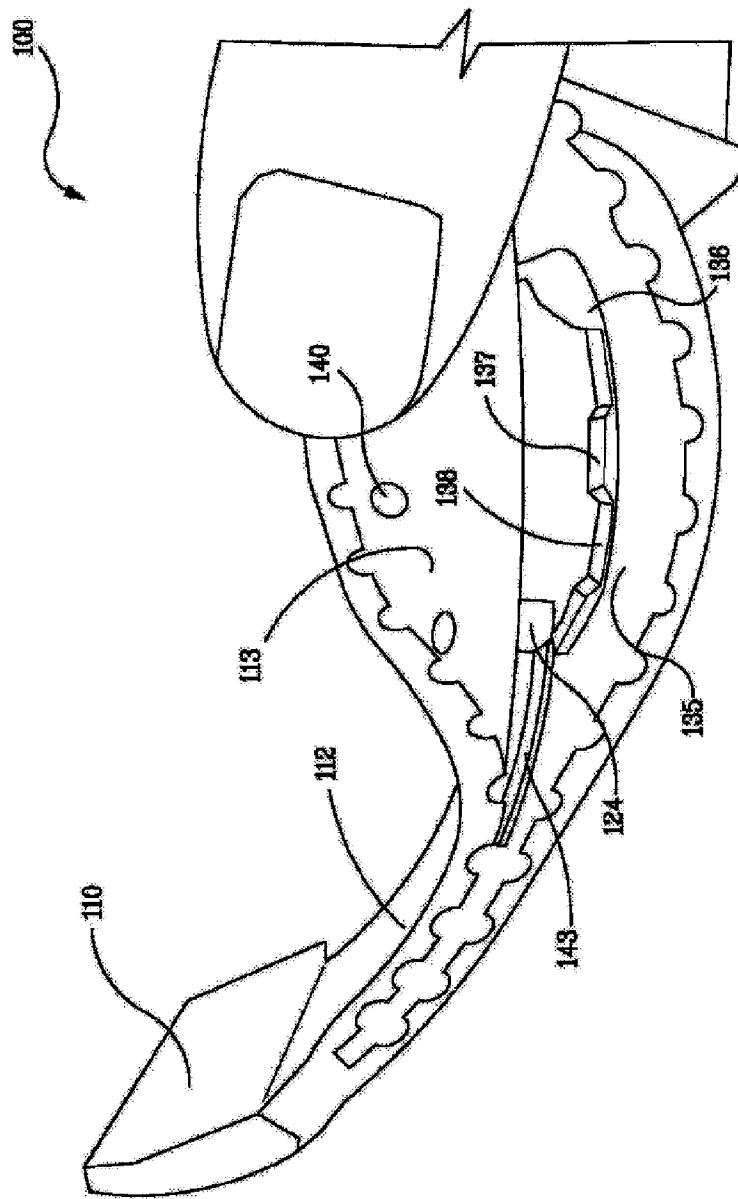


FIG. 7

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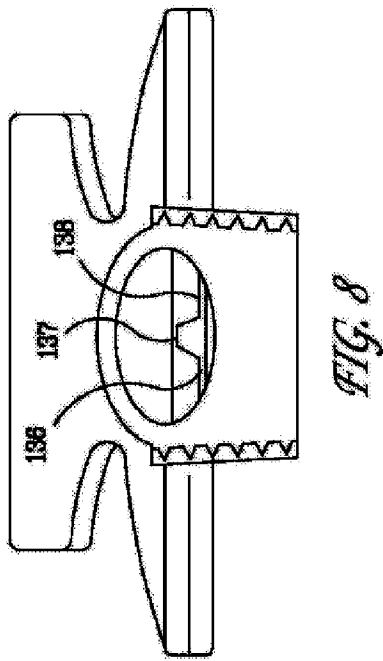
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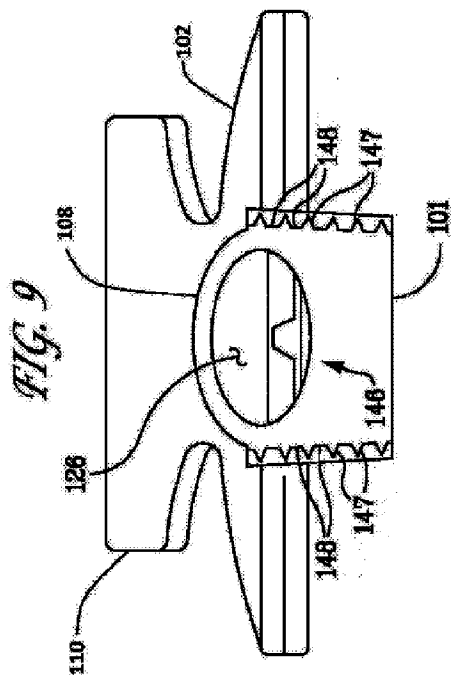
【図 8】



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【図 9】



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【図 10】

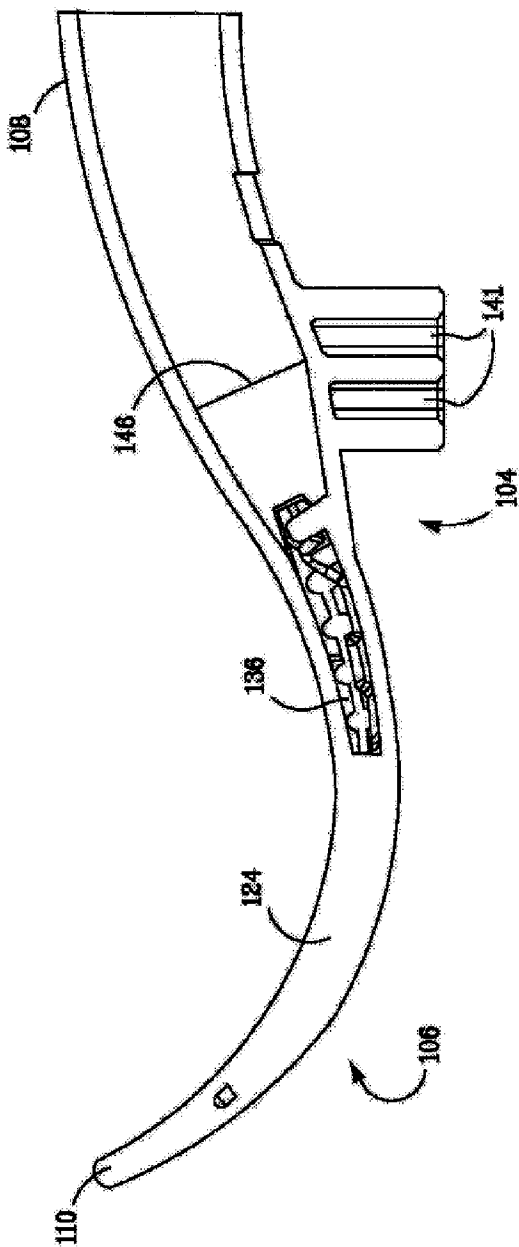


FIG. 10

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【図 11】

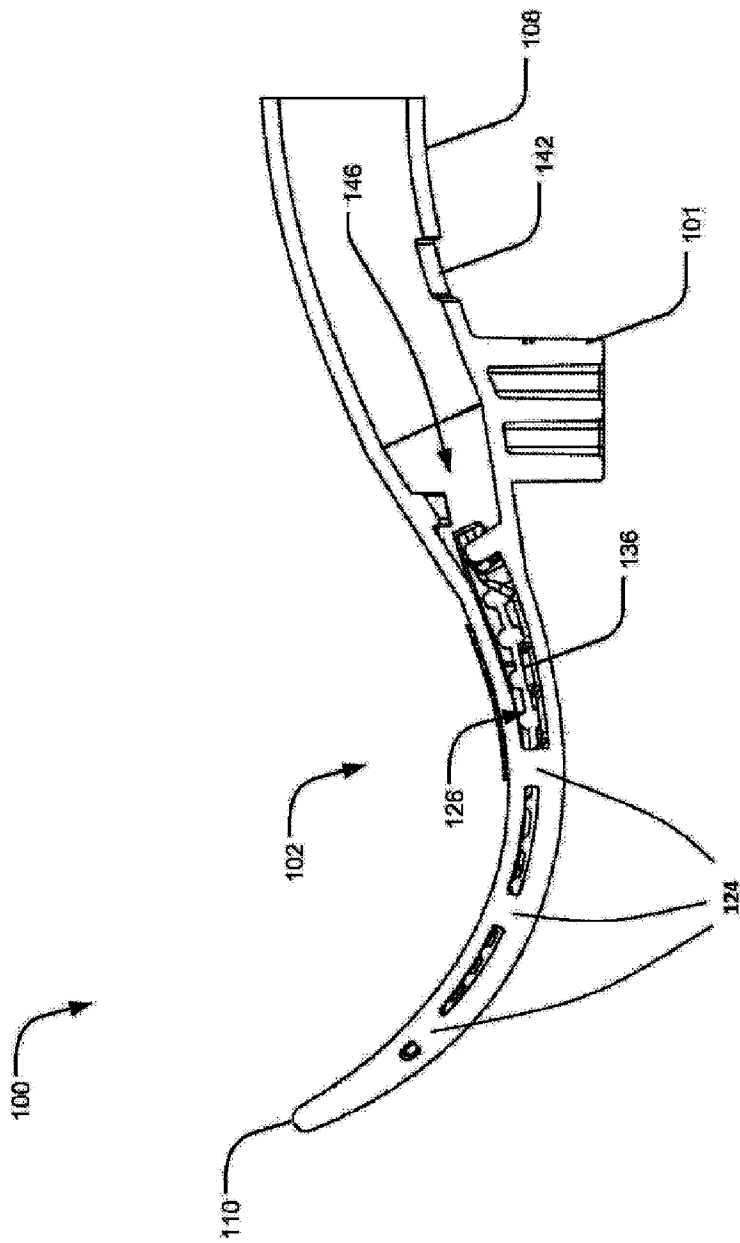


FIG. 11

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		Country Code ³ Number ⁴ Kind Codes (if known)				
		EP 3965637 B1	12-18-2024	Solmetex, LLC		
		JP 7617081 B2	01-08-2025	Dryshield, LLC		

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		Australian Application No. 2020274979, Examination Report dated 1/20/25 (INCEP-005AU)	

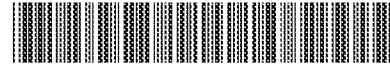
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(11)

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A61C 17/06 (2006.01) **A61C 17/10** (2006.01)

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(56) References cited:
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US-A1- 2014 212 838 US-A1- 2015 335 409
US-A1- 2017 156 832

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- **No further relevant documents disclosed**

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Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention generally relates to the field of dental mouthpieces. More specifically, the present invention relates to intraoral dental suction and isolation mouthpieces.

2. Description of Related Art

[0002] Various mouthpieces are currently used by dental health professionals, dental hygienists, and dental assistants in the field of dentistry. In the past, a dental patient has been treated by a traditional two-person team that comprises a dental professional and a dental assistant. Further, dental treatment may be provided by the team using many different types of dental equipment and materials. Such dental equipment and materials may include such items as an intraoral mirror, a bite block, a slow speed suction ejector, a high speed suction ejector, gauzes, cotton rolls, and dry angles. Each item of dental equipment may be used for different purposes, though some may be used in combination for some types of dental services. As such, a dental professional seeking to provide such dental services may need to use multiple items of such dental equipment. An important role of the dental assistant is therefore to assist the dental professional in coordinating the use of these multiple items of different equipment and materials.

[0003] U.S. Patent Application Publication No. US 2017/0156832 A1 discloses a saliva ejector that utilizes a single planar double leaf shaped plate design that is embossed on their inner faces with a series of arced ribs and folded about its midpoint. A tab and slot arrangement about the center of the plates joins the two plates. Placement of the ejector within the mouth lies along the interior of the patient's cheek.

[0004] U.S. Patent Application Publication No. US 2014/0212838 A1 teaches a dental mouthpiece that may be attached to a high-suction dental adapter. The mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion.

[0005] U.S. Patent Application Publication No. US 2015/0335409 A1 discloses an intraoral device. The device includes a flexible body having an upper front flap including evacuations holes and a upper edge; an upper rear flap forming an upper pocket with the upper front flap and including internal channels and a upper edge separated from the upper edge of the upper front flap to form an upper pocket opening; a lower front flap including evacuation holes and a lower edge, a lower rear flap forming a lower pocket with the lower front flap and including internal channels and a lower edge separated from the lower edge of the lower front flap to form a lower pocket opening.

[0006] There is, therefore, 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.

SUMMARY OF THE CLAIMED INVENTION

[0007] The invention is defined in independent claim 1. Particular embodiments are set out in the dependent claims.

[0008] In particular, a dental mouthpiece formed in a curve is disclosed. Such a mouthpiece may comprise of a main body portion at a central part of the curve having a first end and a second end, a suction connector portion connected to the main body portion at the first end, and a cheek retractor portion connected to the main body portion at the second end.

[0009] The main body portion, the suction connector portion, and the cheek retractor portion may be molded in one piece, preferably by injection molding. The mouthpiece may be made of a material that is flexible, translucent, conductive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0010] The main body portion comprises of an anterior wall inside the curve and a posterior wall outside the curve. The anterior wall and the posterior wall may define an interior space, within which at least one connector connects the anterior wall to the posterior wall. At least one anterior intervening wall extends from the anterior wall partially towards the posterior wall, and at least one posterior intervening wall extends from the posterior wall partially towards the anterior wall. The anterior intervening walls and the posterior intervening walls each has alternating crests and troughs.

BRIEF DESCRIPTION OF THE FIGURES

[0011]

FIG. 1 is a top view of the dental mouthpiece;
FIG. 2 is an isometric view of a dental mouthpiece shown in FIG. 1;
FIG. 3 is a rear view of the dental mouthpiece shown in FIG. 1;
FIG. 4 is a bottom view of the dental mouthpiece shown in FIG. 1;
FIG. 5 is a coronal top cross section view of the dental mouthpiece shown in FIG. 1; and
FIG. 6 is a side view of the dental mouthpiece shown in FIG. 1;
FIG. 7 is a side of the dental mouthpiece shown in FIG. 1 with an anterior wall of the mouthpiece pulled away from a posterior wall of the mouthpiece;
FIG. 8 is a transverse cross section view of the dental mouthpiece shown in FIG. 1 at the intersection be-

tween the suction connector and the main body.

FIG. 9 is a transverse cross section view of the dental mouthpiece shown in FIG. 1 at the intersection between the suction connector and the main body.

FIG. 10 is a longitudinal cross section view of an embodiment of the dental mouthpiece shown in FIG. 1 with a wall connector.

FIG. 11 is a longitudinal cross section view of an embodiment of the dental mouthpiece shown in FIG. 1 with column connectors.

DETAILED DESCRIPTION

[0012] Embodiments of the present invention may include 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, a suction connector portion, a stability bar, and a bite block. In some embodiments, any combination of the main body portion, cheek retractor portion, suction connector portion, a stability bar and bite block (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, resilient, at least translucent, and conducive to injection molding. Such a material may include thermoplastic elastomers known in the art.

[0013] FIG. 1 is a top view of the dental mouthpiece. A dental mouthpiece 100 includes a main body portion 102 having a first end 104 and a second end 106 opposite the first end 104. A longitudinal axis 103 may extend from the first end 104 to the second end 106. In the illustrated embodiment, a suction connector portion 108 may be coupled to the first end 104 and a cheek retractor portion 110 may be coupled to the second end 106, though in other examples the mouthpiece 100 may not have a suction connector portion 108 and/or a cheek retractor portion 110. A bite block 101 may also be integrated to the suction connector portion 108 near the first end 104 of the main body portion 102, though the bite block 101 may be positioned anywhere on the suction connector portion 108.

[0014] The main body portion 101 may include a neck 120 extending from the second end 106 to the cheek retractor portion 110. The neck 120 may have a width 122 that is less than a width of the main body portion 102, a width of the cheek retractor portion 110, and/or a width of the suction connector portion 108, though the width 122 may be greater than the width of the main body portion 102, the cheek retractor portion 110, and/or the suction connector portion 108 in other examples.

[0015] In the illustrated embodiment, the suction connector portion 108, the cheek retractor portion 110, the bite block 101, and the main body portion 102 are constructed as one piece, though in other examples each of the suction connector portion 108, the cheek retractor

portion 110, the bite block 101, and/or the main body 102 may be separate pieces. For example, in some embodiments, the main body portion 102, the cheek retractor portion 110, and the suction connector portion 108 (and sub-portions thereof) may be molded as one-piece, preferably by injection molding and the bite block 101 may be a separate piece attachable to the suction connector portion 108. In an exemplary embodiment, the mouthpiece 100 may be made of a material that is flexible, resilient, translucent, and conducive to injection molding. Such a material may include thermoplastic elastomer.

[0016] FIG. 2 is an isometric view of a dental mouthpiece shown in FIG. 1. As illustrated in FIG. 2, the main body portion 102 may be shaped in a curve. Because the mouthpiece 100 is made of a flexible and resilient material (e.g., thermoplastic elastomer), the mouthpiece 100 may be bent when placed in a patient's mouth to conform to the shape of the mouth. When properly positioned, the suction connector portion 108 may protrude from one side of the patient's mouth, while the main body portion 102 lies against the back of the patient's mouth, and the cheek retractor portion 110 presses against the patient's cheek on the opposite side of the patient's mouth.

[0017] The cheek retractor portion 110 may be configured to press against and retract a patient's cheek away from the patient's teeth on an opposite side of the patient's mouth than the side from which the connection portion 108 extends. The flexibility of the material used to form the mouthpiece 100 allows for some bending when placed in the patient's mouth, but the resilience of the material further allows the mouthpiece 100 to apply pressure against a part of the patient's mouth when the mouthpiece 100 is released from bending. The material is resilient enough, for example, to allow the cheek retractor portion 110 to press against the inside of the patient's cheek with such pressure being sufficient to move the cheek away from the patient's teeth. The cheek retractor portion 110 is illustrated as a hammerhead distal region, which may be attached to the main body portion 102. The cheek retractor portion 110 may be solid in some examples, though may be hollow in other examples.

[0018] The main body portion 102 may comprise an anterior wall 112 on an inner part of the curve and a posterior wall 114 (also seen in FIG. 4) on an outer part of the curve. The anterior wall 112 may face a front of the patient's mouth and the posterior wall 114 may face a back of the patient's mouth. The anterior wall 112 and the posterior wall 114 of the main body portion 102 may be configured in parallel to each other. The anterior wall 112 has a defined shape that may correspond to the defined shape of the posterior wall 114, though the anterior wall 112 may be a different shape than the posterior wall 114 in other examples. The defined shape may be wider at the first end 104 and narrower at the second end 106. In some embodiments, the shape corresponds to a shield shape though the shape may be, for example, a square,

a straight line arrow, a rectangle, a star, an oval, a circle, or a shape that generally conforms to the intraoral shape of the patient's mouth. Differently-sized mouthpieces may be provided for differently-sized mouths of adults and children. Part of the shape at the first end 104 may be formed with thicker walls than the rest of the main body portion 102. Such thickening may provide additional stability at the first end 104. When positioned within the mouth of a patient, the anterior wall 112 and the posterior wall 114 are capable of blocking an airway of the patient, while the bite block 101 is positioned between the patient's teeth, the suction connector portion 108 extends from one side of the patient's mouth, and the cheek retractor portion 110 presses against the cheek on the opposite side of the patient's mouth.

[0019] The main body portion 102 may also include openings 140 located on the anterior wall 112 and/or the posterior wall 114. Such openings 140 (e.g., perforations, slit, aperture, etc.) allow for suction of air, fluids, and small debris from the patient's mouth through the openings 140 and into the interior space 126, and into the suction connector portion 108 towards a suction source. The openings 140 may be positioned on a perimeter of the shape of the anterior wall 112 and/or the posterior wall 114. In the same example, the openings 140 may be positioned on either side of the neck 120 on the anterior wall 112 and/or the posterior wall 114. In another example, the openings 140 are apertures. In the same example, the apertures are each the same size, though in other examples some or all of the apertures may be different sizes.

[0020] FIG. 3 is a rear view of the dental mouthpiece shown in FIG. 1. As visible in FIG. 3, the suction connector portion 108 may be oval-shaped and also attached to the main body portion 102. The suction connector portion 108 may be formed with thicker walls than the main body portion 102 and configured to attach to a high-suction vacuum adapter and to assist in transferring water, saliva, and debris from the interior space 126 to the external adapter for removal. The suction connector portion 108 may also include an internal stop to assist in sliding the mouthpiece onto the adapter to a desired depth.

[0021] The superior wall 116 in FIG. 3 may be used herein to refer to the side that rests against a roof of a patient's mouth when placed therein, and the inferior wall 118 may be used to refer to the side that rests against the floor of the patient's mouth. The superior wall 116 and inferior wall 118 may be formed identically, which may allow for the mouthpiece to change orientation such that the superior wall 116 may appear as the inferior wall 118 and vice versa, in the new orientation. When in use, the superior wall 116 and the inferior wall 118 of the main body portion 101 may serve to protect and separate the top of the mouth and the bottom of the mouth/tongue. In addition, the main body portion 101 may also serve to protect the back of the mouth (e.g., throat and airway) from falling debris.

[0022] FIG. 4 is a bottom view of the dental mouthpiece shown in FIG. 1. The anterior wall 112 and the posterior

wall 114 may be connected to each other at by at least one connector 124. In some embodiments, the suction connector portion 108 may have a cutout 142 (e.g., which may be shaped as a logo, a rectangular notch, a square notch, or a circular notch, or any shaped notch) providing extra interlocking with a corresponding protrusion (e.g., which may also be shaped as a logo, a rectangular protrusion, a square protrusion, or a circular protrusion, or any shaped protrusion) on an external high-suction vacuum adapter.

[0023] The bite block 101 may be reinforced by bite block openings 141 to create cavities in the bite block to result in a more stable bite block. In an embodiment, the bite block openings 141 may be two parallel rectangular openings that open at the bottom of the bite block. The bite block openings 141 may extend up to the suction connector portion 108 but not extending past the thickness of the suction connector portion 108.

[0024] FIG. 5 is a coronal top cross section view of the dental mouthpiece shown in FIG. 1. The main body portion 102 may include the bridge structure 136 that protrudes from the interior surface 135 of the posterior wall 114, as shown in FIG. 5 and also visible in FIGS. 7 and 8. In some embodiments, the bridge structure 136 may follow the shape of a logo (e.g., an arrowhead or shield). The bridge structure may have a gap at the tip of the arrowhead shape, creating an open arc instead of a point of an arrow. In some embodiments, the bridge structure 136 may be centrally-located in the main body portion 110 of the mouthpiece 100. In some examples, such bridge structure 136 may protrude from the interior surface 135 in a wave shape with bridge crests 137 and bridge troughs 138. In other embodiments, the bridge structure 136 may protrude in the shape of battlements or trapezoids. The bridge crests 137 provide a plurality of contact points that are generally separate from the anterior wall 112. The bridge crests 137 near the opening 146 of the suction connector portion 108 may have a greater height than the bridge crests 137 further from the opening 146, as visible in FIGS. 7 and 8. The bridge crests 137 near the opening 146 of the suction connection portion 108 may also be longer than the bridge crests 137 further away from the suction connection portion 108 as shown later in FIG. 8. The bridge troughs 138 may be substantially flush or extend above the interior surface 135. The bridge crests 137 contact the anterior wall 112 during suction to keep the anterior wall 112 spaced away from the posterior wall 114 during suction, thereby preventing collapse of the anterior wall 112 or the posterior wall 114 into the interior space 126 so that debris and/or water can be evacuated through the interior space 126. Meanwhile, the bridge troughs 138 provide gaps that allow for suction of air, fluids, and small debris through the bridge structure 136. In other examples, the bridge structure 136 may be smooth, may include sharp crests and sharp troughs, circular crests and circular troughs, square crests and square troughs, or shape or combination of shapes of crests and troughs.

[0025] The main body portion 102 may further include a stability bar 143, shown in FIG. 5 and also visible in FIG. 7, that extends from approximately the center of the main body portion 102 toward the cheek retractor portion 110. Such stability bar 143 may protrude from the interior surface 135 of the posterior wall 114 along the longitudinal axis 103. In an embodiment, the stability bar 143 begins from the open arc of the bridge structure 136 and continues along the longitudinal axis 103 towards the second end 106 past the neck 120 and ends before reaching the cheek retractor portion 110. The stability bar 143 may protrude from the interior surface 135 of the posterior wall 114 towards the interior surface 113 of the anterior wall 112. The stability bar 143 may be of any height ranging from the height of the interior space 126 or any height less than the interior space 126. In an embodiment, the stability bar 143 may have attached connectors 124 at specific locations that may attach the anterior wall 112 to the posterior wall 114. The connectors 124 on the stability bar 143 may assist with retraction, stability, support and curvature of the mouthpiece 100 during suction. In an exemplary embodiment, there may be multiple connectors 124 aligned with the stability bar 143 the stability bar 143, though the stability bar 143 may not be aligned with the at least one connector 124 in other examples.

[0026] FIG. 6 is a side view of the dental mouthpiece shown in FIG. 1. FIG. 6 illustrates the view of the inferior side that rests against the floor of the patient's mouth. The anterior wall 112 and the posterior wall 114 are spaced from each other and define the interior space 126. Other than the at least one connector 124, a stability bar 143, and a bridge structure 136, the interior space 126 is generally open and unobstructed, thereby allowing for suction to flow throughout the interior space 126. The interior space 126 between the anterior wall 112 and the posterior wall 114 generally follows the same defined shape of the anterior wall 112 and the posterior wall 114. In one example, the interior space 126 extends through the neck 120, though in other examples the interior space 126 may not extend through the neck 120. In yet other examples, the interior space 126 extends through the neck 120 and into the cheek retractor portion 120.

[0027] At least one anterior intervening wall 127 may extend from at least one edge 128 of the anterior wall 112 partially towards the posterior wall 114 and may have a thickness that extends from the at least one edge 128 to a mid-point between the anterior wall 112 and the posterior wall 114. The span of such anterior intervening wall 127 therefore may not extend the entire distance between the anterior wall 112 and the posterior wall 114. The thickness of such anterior intervening wall 127 may increase from the cheek retractor portion 110, through the neck 120, and to the first end 104. Such increasing depth may provide for increased rigidity at the first end 104. Such anterior intervening wall 127 may further be ridged in some embodiments, or have a smooth edge in other embodiments. In one example, the anterior intervening wall 127 includes an alternating crest 130 and

trough 132. In the illustrated embodiment, the crests 130 are a flat surface and the troughs 132 are a cylindrical cutout surface, though the crests 130 and the troughs 132 may be any shape. In some examples, the crests 130 and the troughs 132 extend the entire depth of the anterior intervening wall 127, though in other examples the crests 130 and/or the troughs 132 may extend partially along the anterior intervening wall 127. The crests 130 and the troughs 132 may provide further retraction, stability, support and curvature to the mouthpiece 100.

[0028] The posterior wall 114 may have a corresponding at least one posterior intervening wall 134 that extends from at least one edge 133 of the posterior wall 114 and partially extends towards the anterior wall 112. The posterior intervening wall 134 may likewise exhibit ridges that are the same, a mirror image, or different from the ridges of the anterior intervening wall 127. In one example, the ridges of the anterior intervening wall 127 may be aligned with the ridges of the posterior intervening wall 134, as shown in FIG. 6. In combination, the anterior intervening wall 127 and the posterior intervening wall 134 and their respective aligned ridges may form an open mesh between the anterior wall 112 and the posterior wall 114. Such open mesh may follow the edges 128, 133 of each of the anterior wall 112 and the posterior wall 114 from the first end 104 to the second end 106. The open mesh between the anterior intervening wall 127 and the posterior intervening wall 134 allows for suction of air, fluids, and small debris from patient's mouth, through the mesh into the interior space 126 and into the suction connector portion 108 towards a suction source.

[0029] The anterior intervening wall 127 may join with the posterior intervening wall 134 at the superior wall 116 and the inferior wall 118 at near the suction connector portion 108 of the main body at the first end 104. The anterior intervening wall 127 may also join with the posterior intervening wall 134 at the superior wall 116 and the inferior wall 118 near the cheek retractor portion 110 at the second end 106. In some embodiments, the anterior intervening wall 127 may join with the posterior intervening wall 134 at the cheek retractor portion 110.

[0030] FIG. 7 is a side of the dental mouthpiece shown in FIG. 1 with an anterior wall of the mouthpiece pulled away from a posterior wall of the mouthpiece. The at least one connector 124 may span the distance between the anterior wall 112 and the posterior wall 114 within the interior space 126. In other words, the connector 124 may be attached to an interior surface 135 of the posterior wall 114 and to an interior surface 113 of the anterior wall 112. The at least one connector 124 may provide structural rigidity to the mouthpiece 100 and may be a pillar, column, wall, or the like. In the illustrated example, the at least one connector 124 includes three connectors, each in the shape of a pillar and linearly spaced from each other.

[0031] FIG. 8 is a transverse cross section view of the dental mouthpiece shown in FIG. 1. The bridge crests 137 near the opening 146 of the suction connector portion

108 may have a greater height than the bridge crests 137 further from the opening 146. The bridge crests 137 near the opening 146 of the suction connection portion 108 may also be longer than the bridge crests 137 further away from the suction connection portion 108.

[0032] FIG. 9 is a transverse cross section view of the dental mouthpiece in FIG. 1. FIG 9 illustrates where the suction connector attaches to the main body. As visible in FIG. 9, the suction connector portion 108 may be oval-shaped and also attached to the main body portion 102 in a seamless transition until the main body reaches the bridge structure 136, where the bridge crests 137 and the bridge troughs 138 may partially block the opening of the main body portion 102 near the suction connector portion 108. The bite block 101 is attached on the outside of the suction connector portion 108 such a manner that the bite block does not interrupt the opening of the suction connector portion 108.

[0033] The suction connector portion 108 may include an opening 146 (also shown in FIG. 5), that opens into an interior space 126 of the main body portion 102 to allow for fluid communication between the interior space 126 and the suction connector portion 108. At least one suction connector portion wall 144 may extend from the anterior wall 112 to the posterior wall 114 near the opening 146 of the suction connector portion 108 to prevent collapse of the anterior wall 112 and the posterior wall 114 during suctioning. The at least one suction connector portion wall 144 includes a pair of walls positioned on either side of the opening 146 of the suction connector portion 108.

[0034] The bite block 101 may include bite block crests 147 and bite block troughs 148 on either sides of the bite block to create greater traction and support for the bite block. In an embodiment, the bite block crests 147 and bite block troughs 148 may create jagged shape or wave shape on either sides of the bite block, although the bite block crests 147 and bite block troughs 148 may be in any shape.

[0035] FIG. 10 is a cross section view of an embodiment of the dental mouthpiece shown in FIG. 1 with a wall connector. In this embodiment, the connector 124 connects the anterior wall 112 with the posterior wall 114 at the longitudinal axis 103 as a solid wall. The connector 124 extends from the neck 120 at the second end 106 some distance away from the cheek retractor portion 110 towards the first end 104 along the longitudinal axis 103 and stops near the opening of the bridge structure 136 around the mid-point of the main body portion 102. In other embodiment, the connector 124 may extend along the longitudinal axis 103 and stop anywhere within the interior space 126 of the main body portion.

[0036] FIG. 11 is a longitudinal cross section view of an embodiment of the dental mouthpiece shown in FIG. 1 with column connectors. In this embodiment, the connector 124 connects the anterior wall 112 with the posterior wall 114 at the longitudinal axis 103 as three evenly spaced cylindrical pillars in line with the stability bar 143.

A first connector is positioned in the main body portion 102, a second connector is positioned near the neck 120, and a third connector is spaced near the cheek retractor portion 110. The linear spacing of the three connectors may provide additional rigidity to the neck 120, while maintaining a narrow width 122 of the neck 120. In other examples, such connectors 124 may be located in the area where a positioned mouthpiece 100 begins to wrap from one side of the mouth, to the back of the mouth, then to the other side of the mouth, thereby assisting in shaping the mouthpiece 100 to the general intraoral shape of a patient's mouth. In other examples, the at least one connector 124 may include one connector, two connectors, or more than two connectors and each connector may be positioned anywhere on the mouthpiece 100. In one example, the at least one connector 124 is a rib that extends from the main body portion 102, through the neck 120, and to the cheek retractor portion 110.

[0037] The mouthpiece as described herein may be used with a one-piece, autoclavable, high-suction vacuum adapter. Such a high-suction vacuum body adapter may be made of a single homogenous material. Having a single lever design, such a vacuum adapter may function in the same manner as all the current high-suction vacuum evacuators and saliva ejectors in controlling the removal of water, saliva, and debris from the oral cavity to the outside vacuum source. The single lever may be designed to control the removal of water, saliva, and debris from the at least partially enclosed so main body through a single, large evacuation conduit within the suction connector portion.

[0038] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. The descriptions are not intended to limit the scope of the invention to the particular forms set forth herein. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above-described exemplary embodiments. It should be understood that the above description is illustrative and not restrictive. To the contrary, the present descriptions are intended to cover such alternatives, modifications, and equivalents as may be included within the scope of the invention as defined by the appended claims and otherwise appreciated by one of ordinary skill in the art. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the appended claims.

Claims

1. A dental mouthpiece (100) formed in a curve, the dental mouthpiece (100) comprising:

a main body portion (102) at a central part of the curve having a first end (104) and a second end (106), the main body portion (102) having an

anterior wall (112) inside the curve and a posterior wall (114) outside the curve and spaced at a distance from the anterior wall (112), the anterior wall (112) and the posterior wall (114) defining an interior space (126), at least one connector (124) connecting the anterior wall (112) to the posterior wall (114);

a suction connector portion (108) connected to the first end (104), the suction connector portion (108) connecting the interior space (126) to a vacuum suction source; and
a cheek retractor portion (110) connected to the second end (106);

characterized in that:

the dental mouthpiece (100) comprises at least one intervening wall (127, 134) extending from an edge (128) of the anterior wall (112) partially towards the posterior wall (114) or extending from an edge (133) of the posterior wall (114) partially towards the anterior wall (112), wherein the at least one intervening wall (127, 134) has a plurality of alternating crests (130) and troughs (132).

2. The mouthpiece of claim 1, wherein the at least one connector (124) is a cylindrical shaped pillar, or wherein the at least one connector (124) is a wall spanning longitudinally in the main body portion (102) in the interior space (126).
3. The mouthpiece of claim 1 or 2, further comprising a bridge structure (136) in the interior space (126) protruding from the posterior wall (114), wherein the protrusions are battlement-shaped, with spaced crests (130, 137), wherein preferably the protrusions near the suction connector (108) is in greater height and length, or spaces between the crests (130, 137) are troughs (132, 138) of the battlement-shape.
4. The mouthpiece of claim 1, 2 or 3, wherein the alternating crests (130, 137) and troughs (132, 138) on the at least one intervening wall (127, 134) are semi-circle shaped.
5. The mouthpiece of any of the preceding claims, wherein the at least one intervening wall (127, 134) has varying heights to maintain integrity of the main body portion (102).
6. The mouthpiece of any of the preceding claims, wherein the troughs (132, 138) of the at least one intervening wall (127, 134) decreases in size as the troughs (132, 138) approach the cheek retractor portion (110).
7. The mouthpiece of any of the preceding claims, wherein the at least one intervening wall (127) and another intervening wall (134) meet at a point where

the suction connector (108) meets the main body (102).

8. The mouthpiece of any of the preceding claims, wherein the at least one intervening wall (127) and the other intervening wall (134) meet at a point where the main body (102) meets the cheek retractor portion (110).
9. The mouthpiece of any of the preceding claims, further comprising a bite block (101) integrated to the suction connector portion (108), wherein the bite block (101) provides additional crush-resistance and decreased compressibility during biting by a patient.
10. The mouthpiece of any of the preceding claims, wherein the main body portion (102), the suction connector portion (108), and the cheek retractor portion (110) are formed by injection-molding as one piece.
11. The mouthpiece of any of the preceding claims, wherein a material that forms the main body (102), the suction connector portion (108), and the cheek retractor portion (110) is a flexible, translucent, high heat-resistant, autoclavable silicon-based material.
12. The mouthpiece of any of the preceding claims, wherein the posterior wall (114) further includes a stability bar (143) protruding from an interior surface of the posterior wall (114) and along a longitudinal axis of the main body (102), and wherein preferably the at least one connector (124) lies evenly spaced along the stability bar (143).
13. The mouthpiece of any of the preceding claims, wherein the suction connector portion (108) comprises a cutout corresponding to a protrusion on a vacuum adapter interlocking fit.
14. The mouthpiece of any of the preceding claims, wherein the suction connector portion (108) connects to a vacuum source, wherein activation of the vacuum source provides suction of fluids from the interior space (126) of the main body (102), and wherein preferably the activation of the vacuum source draws fluids from an exterior of the main body (102) through the crests (130, 137) and troughs (132, 138) of the at least one intervening wall (127, 134), into the interior space (126) of the main body (102).
15. The mouthpiece of any of the preceding claims, wherein the cheek retractor portion (110) includes a surface that applies pressure based on resilience of the cheek retractor portion (110).

Patentansprüche

1. Zahnärztliches Mundstück (100), das in einem Bogen geformt ist, wobei das zahnärztliche Mundstück (100) umfasst:
 - einen Hauptkörperabschnitt (102) an einem zentralen Teil des Bogens mit einem ersten Ende (104) und einem zweiten Ende (106), wobei der Hauptkörperabschnitt (102) eine vordere Wand (112) innerhalb des Bogens und eine hintere Wand (114) außerhalb des Bogens und beabstandet von der vorderen Wand (112) hat, wobei die vordere Wand (112) und die hintere Wand (114) einen Innenraum (126) definieren, wobei mindestens ein Verbinder (124) die vordere Wand (112) mit der hinteren Wand (114) verbindet;
 - einen Sauganschlussabschnitt (108), der mit dem ersten Ende (104) verbunden ist, wobei der Sauganschlussabschnitt (108) den Innenraum (126) mit einer Vakuumsaugquelle verbindet; und
 - ein mit dem zweiten Ende (106) verbundener Wangenspreizabschnitt (110);

dadurch gekennzeichnet, dass:

das zahnärztliche Mundstück (100) mindestens eine Zwischenwand (127, 134) umfasst, die sich von einer Kante (128) der vorderen Wand (112) teilweise in Richtung der hinteren Wand (114) erstreckt oder sich von einer Kante (133) der hinteren Wand (114) teilweise in Richtung der vorderen Wand (112) erstreckt, wobei die mindestens eine Zwischenwand (127, 134) eine Vielzahl von abwechselnden Erhebungen (130) und Vertiefungen (132) hat.
2. Mundstück nach Anspruch 1, wobei der mindestens eine Verbinder (124) eine zylindrisch geformte Stütze ist, oder wobei der mindestens eine Verbinder (124) eine Wand ist, die sich im Hauptkörperabschnitt (102) im Innenraum (126) in Längsrichtung erstreckt.
3. Mundstück nach Anspruch 1 oder 2, ferner umfassend eine Brückenstruktur (136) im Innenraum (126), die von der hinteren Wand (114) vorsteht, wobei die Vorsprünge zinnenförmig sind, mit beabstandeten Erhebungen (130, 137), wobei vorzugsweise die Vorsprünge in der Nähe des Sauganschlusses (108) in größerer Höhe und Länge sind, oder die Räume zwischen den Erhebungen (130, 137) Vertiefungen (132, 138) der Zinnenform sind.
4. Mundstück nach Anspruch 1, 2 oder 3, wobei die abwechselnden Erhebungen (130, 137) und Vertiefungen (132, 138) an der mindestens einen Zwischenwand (127, 134) halbkreisförmig sind.
5. Mundstück nach einem der vorhergehenden Ansprüche, wobei die mindestens eine Zwischenwand (127, 134) unterschiedliche Höhen aufweist, um die Stabilität des Hauptkörperteils (102) zu erhalten.
6. Mundstück nach einem der vorhergehenden Ansprüche, wobei die Vertiefungen (132, 138) der mindestens einen Zwischenwand (127, 134) in ihrer Größe abnehmen, wenn sich die Vertiefungen (132, 138) dem Wangenspreizabschnitt (110) nähern.
7. Mundstück nach einem der vorhergehenden Ansprüche, wobei die mindestens eine Zwischenwand (127) und eine weitere Zwischenwand (134) an einem Punkt zusammentreffen, an dem der Sauganschluss (108) auf den Hauptkörper (102) trifft.
8. Mundstück nach einem der vorhergehenden Ansprüche, wobei die mindestens eine Zwischenwand (127) und die andere Zwischenwand (134) an einem Punkt zusammentreffen, an dem der Hauptkörper (102) auf den Wangenspreizabschnitt (110) trifft.
9. Mundstück nach einem der vorhergehenden Ansprüche, das ferner einen Bissblock (101) umfasst, der in den Sauganschlussabschnitt (108) integriert ist, wobei der Bissblock (101) zusätzlichen Druckwiderstand und verringerte Komprimierbarkeit während des Beißens durch einen Patienten bietet.
10. Mundstück nach einem der vorhergehenden Ansprüche, bei dem der Hauptkörperabschnitt (102), der Sauganschlussabschnitt (108) und der Wangenspreizabschnitt (110) durch Spritzgießen als ein Stück geformt sind.
11. Mundstück nach einem der vorhergehenden Ansprüche, wobei das Material, aus dem der Hauptkörper (102), der Sauganschlussabschnitt (108) und der Wangenspreizabschnitt (110) bestehen, ein flexibles, lichtdurchlässiges, hochwärmebeständiges, autoklavierbares Material auf Silikonbasis ist.
12. Mundstück nach einem der vorhergehenden Ansprüche, wobei die hintere Wand (114) ferner eine Stabilitätsstrebe (143) aufweist, die von einer Innenfläche der hinteren Wand (114) und entlang einer Längsachse des Hauptkörpers (102) vorsteht, und wobei vorzugsweise der mindestens eine Verbinder (124) gleichmäßig beabstandet entlang der Stabilitätsstrebe (143) liegt.
13. Mundstück nach einem der vorhergehenden Ansprüche, wobei der Sauganschlussabschnitt (108) eine Aussparung aufweist, die einem Vorsprung an einem Vakuumadapter-Verriegelungssitz entspricht.

14. Mundstück nach einem der vorhergehenden Ansprüche, wobei der Sauganschlussabschnitt (108) mit einer Vakuumquelle verbunden ist, wobei Aktivierung der Vakuumquelle ein Ansaugen von Fluiden aus dem Innenraum (126) des Hauptkörpers (102) bewirkt, und wobei vorzugsweise die Aktivierung der Vakuumquelle Fluide von einer Außenseite des Hauptkörpers (102) durch die Erhebungen (130, 137) und Vertiefungen (132, 138) der mindestens einen Zwischenwand (127, 134) in den Innenraum (126) des Hauptkörpers (102) zieht.

15. Mundstück nach einem der vorhergehenden Ansprüche, wobei der Wangenspreizabschnitt (110) eine Oberfläche aufweist, die Druck basierend auf der Nachgiebigkeit des Wangenspreizabschnitts (110) ausübt.

Revendications

1. Embout buccal dentaire (100) formé selon une courbe, l'embout buccal dentaire (100) comprenant :

une portion corps principal (102) au niveau d'une partie centrale de la courbe ayant une première extrémité (104) et une deuxième extrémité (106), la portion corps principal (102) ayant une paroi antérieure (112) à l'intérieur de la courbe et une paroi postérieure (114) à l'extérieur de la courbe et espacée d'une certaine distance de la paroi antérieure (112), la paroi antérieure (112) et la paroi postérieure (114) définissant un espace intérieur (126), au moins un raccord (124) raccordant la paroi antérieure (112) à la paroi postérieure (114) ;

une portion raccord d'aspiration (108) raccordée à la première extrémité (104), la portion raccord d'aspiration (108) raccordant l'espace intérieur (126) à une source d'aspiration sous vide ; et une portion écarteur de joue (110) raccordée à la deuxième extrémité (106) ;

caractérisé en ce que :

l'embout buccal dentaire (100) comprend au moins une paroi intermédiaire (127, 134) s'étendant depuis un bord (128) de la paroi antérieure (112) en partie vers la paroi postérieure (114) ou s'étendant depuis un bord (133) de la paroi postérieure (114) en partie vers la paroi antérieure (112), dans lequel l'au moins une paroi intermédiaire (127, 134) a une pluralité de crêtes (130) et de creux (132) alternés.

2. Embout buccal selon la revendication 1, dans lequel l'au moins un raccord (124) est un montant de forme cylindrique, ou dans lequel l'au moins un raccord (124) est une paroi se développant longitudinalement dans la portion corps principal (102) dans l'es-

pace intérieur (126).

3. Embout buccal selon la revendication 1 ou 2, comprenant en outre une structure de pont (136) dans l'espace intérieur (126) faisant saillie à partir de la paroi postérieure (114), dans lequel les saillies sont en forme de crêneau, avec des crêtes (130, 137) espacées, dans lequel de préférence les saillies près du raccord d'aspiration (108) sont de hauteur et de longueur supérieures, ou des espaces entre les crêtes (130, 137) sont des creux (132, 138) de la forme en crêneau.

4. Embout buccal selon la revendication 1, 2 ou 3, dans lequel les crêtes (130, 137) et creux (132, 138) alternés sur l'au moins une paroi intermédiaire (127, 134) sont en forme de demi-cercle.

5. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel l'au moins une paroi intermédiaire (127, 134) présente des hauteurs variables afin de maintenir l'intégrité de la portion corps principal (102).

6. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel les creux (132, 138) de l'au moins une paroi intermédiaire (127, 134) sont de taille décroissante à mesure que les creux (132, 138) s'approchent de la portion écarteur de joue (110).

7. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel l'au moins une paroi intermédiaire (127) et une autre paroi intermédiaire (134) se rencontrent en un point où le raccord d'aspiration (108) rencontre le corps principal (102).

8. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel l'au moins une paroi intermédiaire (127) et l'autre paroi intermédiaire (134) se rencontrent en un point où le corps principal (102) rencontre la portion écarteur de joue (110).

9. Embout buccal selon l'une quelconque des revendications précédentes, comprenant en outre une pièce de morsure (101) intégrée à la portion raccord d'aspiration (108), dans lequel la pièce de morsure (101) fournit une résistance à l'écrasement supplémentaire et une compressibilité réduite durant la morsure par un patient.

10. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la portion corps principal (102), la portion raccord d'aspiration (108), et la portion écarteur de joue (110) sont formées par moulage par injection en une seule pièce.

11. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la portion corps principal (102), la portion raccord d'aspiration (108), et la portion écarteur de joue (110) sont formées par moulage par injection en une seule pièce.

cations précédentes, dans lequel un matériau qui forme le corps principal (102), la portion raccord d'aspiration (108), et la portion écarteur de joue (110) est un matériau à base de silicium souple, translucide, hautement résistant à la chaleur, autoclavable. 5

12. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la paroi postérieure (114) inclut en outre une barre de stabilité (143) faisant saillie à partir d'une surface intérieure de la paroi postérieure (114) et le long d'un axe longitudinal du corps principal (102), et dans lequel de préférence l'au moins un raccord (124) repose avec un espacement régulier le long de la barre de stabilité (143). 10 15

13. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la portion raccord d'aspiration (108) comprend une découpe correspondant à une saillie sur un ajustement d'interrouillage d'adaptateur à vide. 20

14. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la portion raccord d'aspiration (108) se raccorde à une source de vide, dans lequel l'activation de la source de vide fournit une aspiration de fluides à partir de l'espace intérieur (126) du corps principal (102), et dans lequel de préférence l'activation de la source de vide aspire des fluides à partir d'un extérieur du corps principal (102) à travers les crêtes (130, 137) et les creux (132, 138) de l'au moins une paroi intermédiaire (127, 134), jusque dans l'espace intérieur (126) du corps principal (102). 25 30 35

15. Embout buccal selon l'une quelconque des revendications précédentes, dans lequel la portion écarteur de joue (110) inclut une surface qui applique de la pression sur la base de l'élasticité de la portion écarteur de joue (110). 40 45 50 55

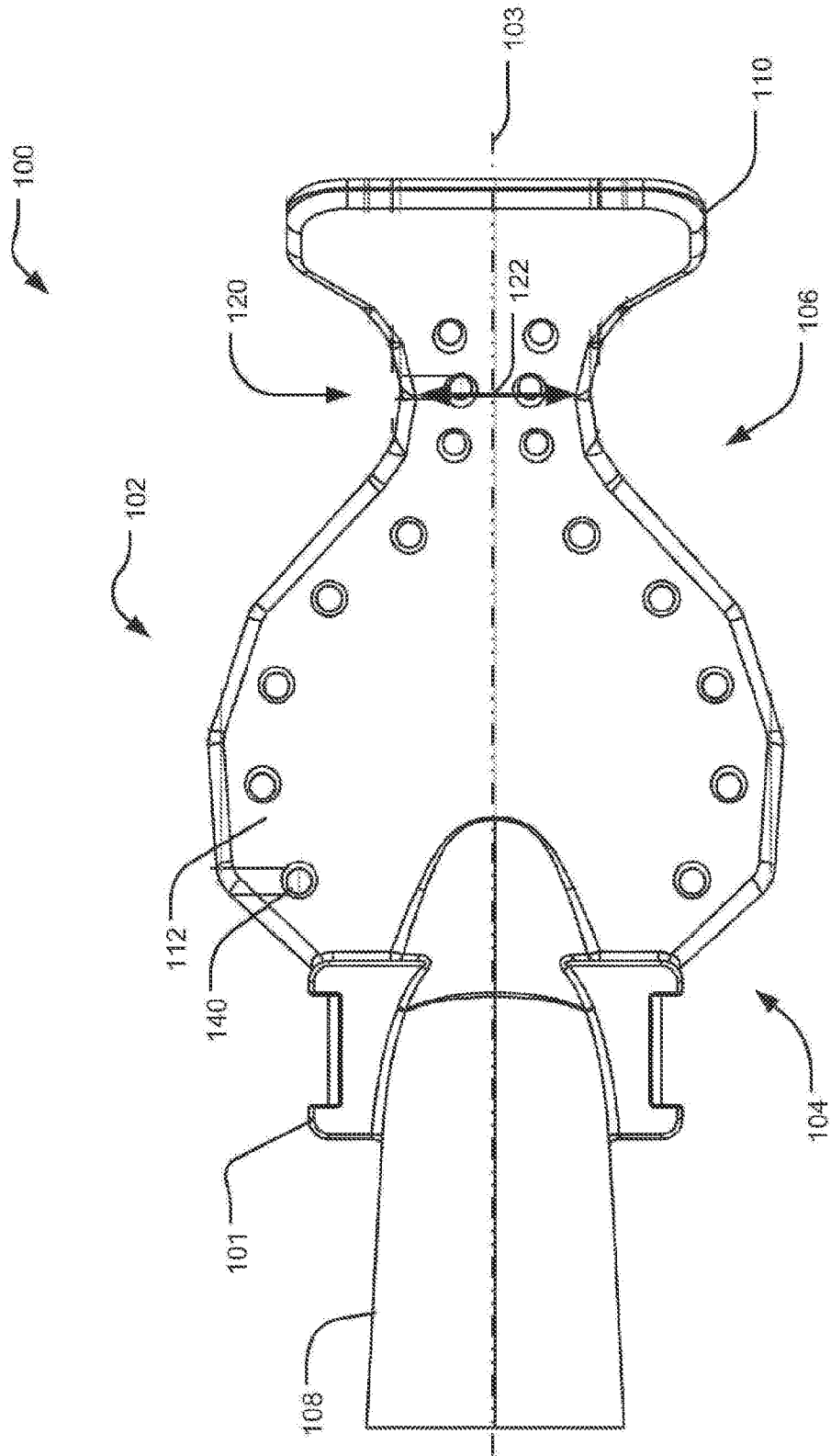
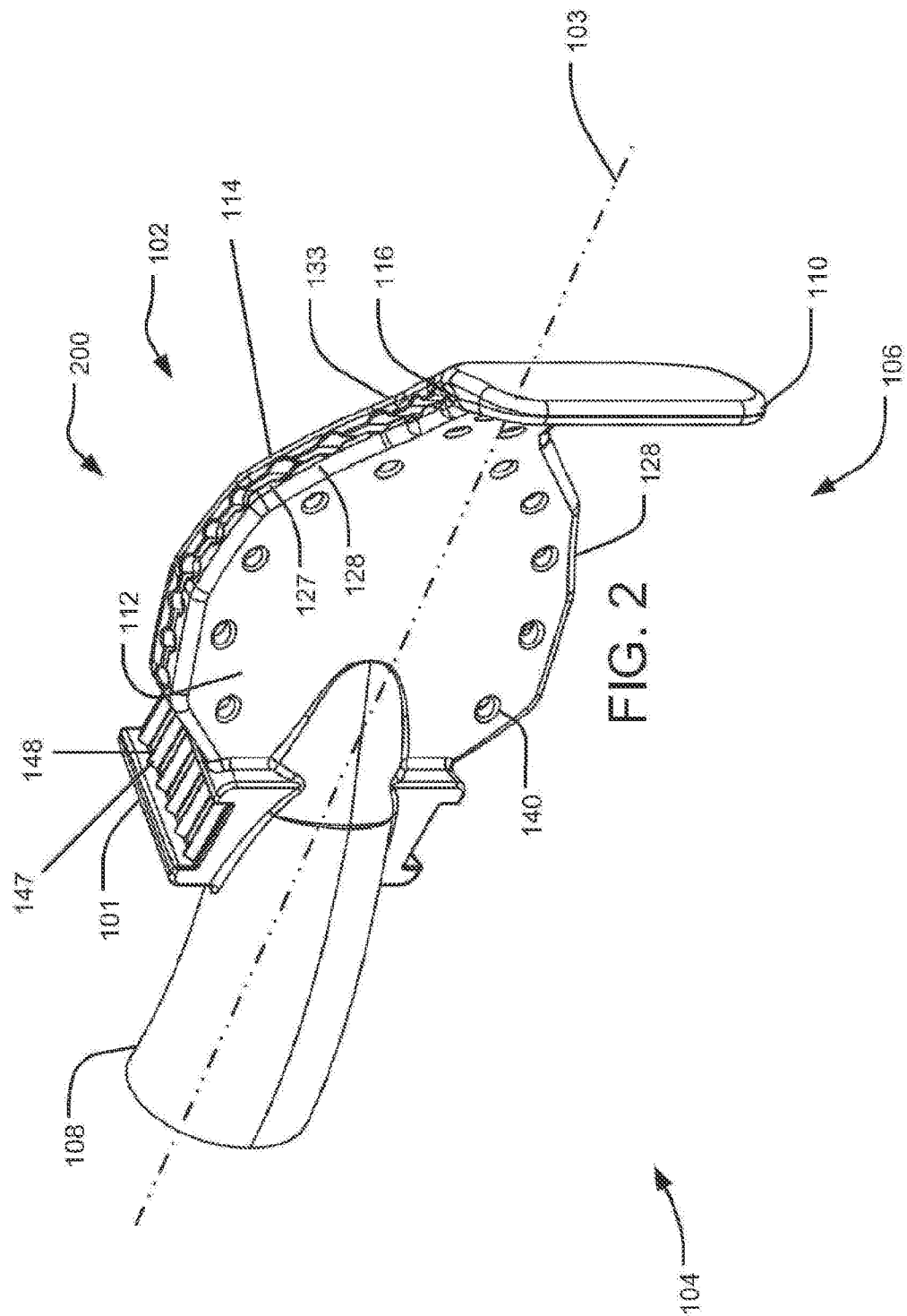


FIG. 1



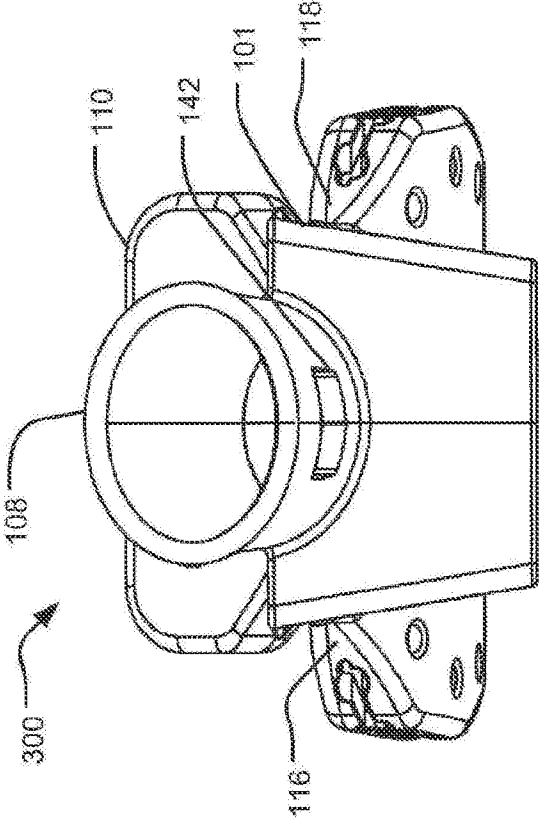


FIG. 3

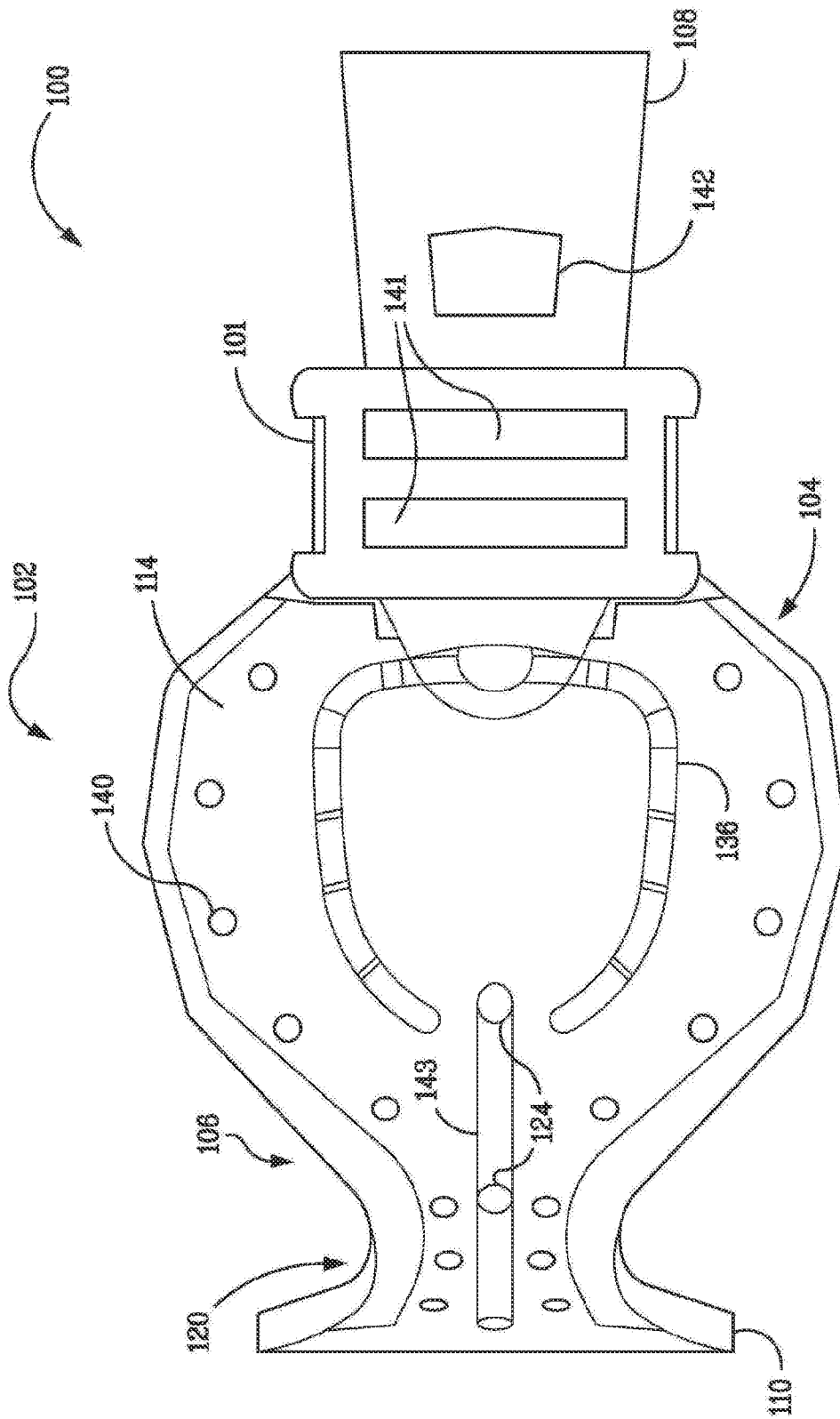
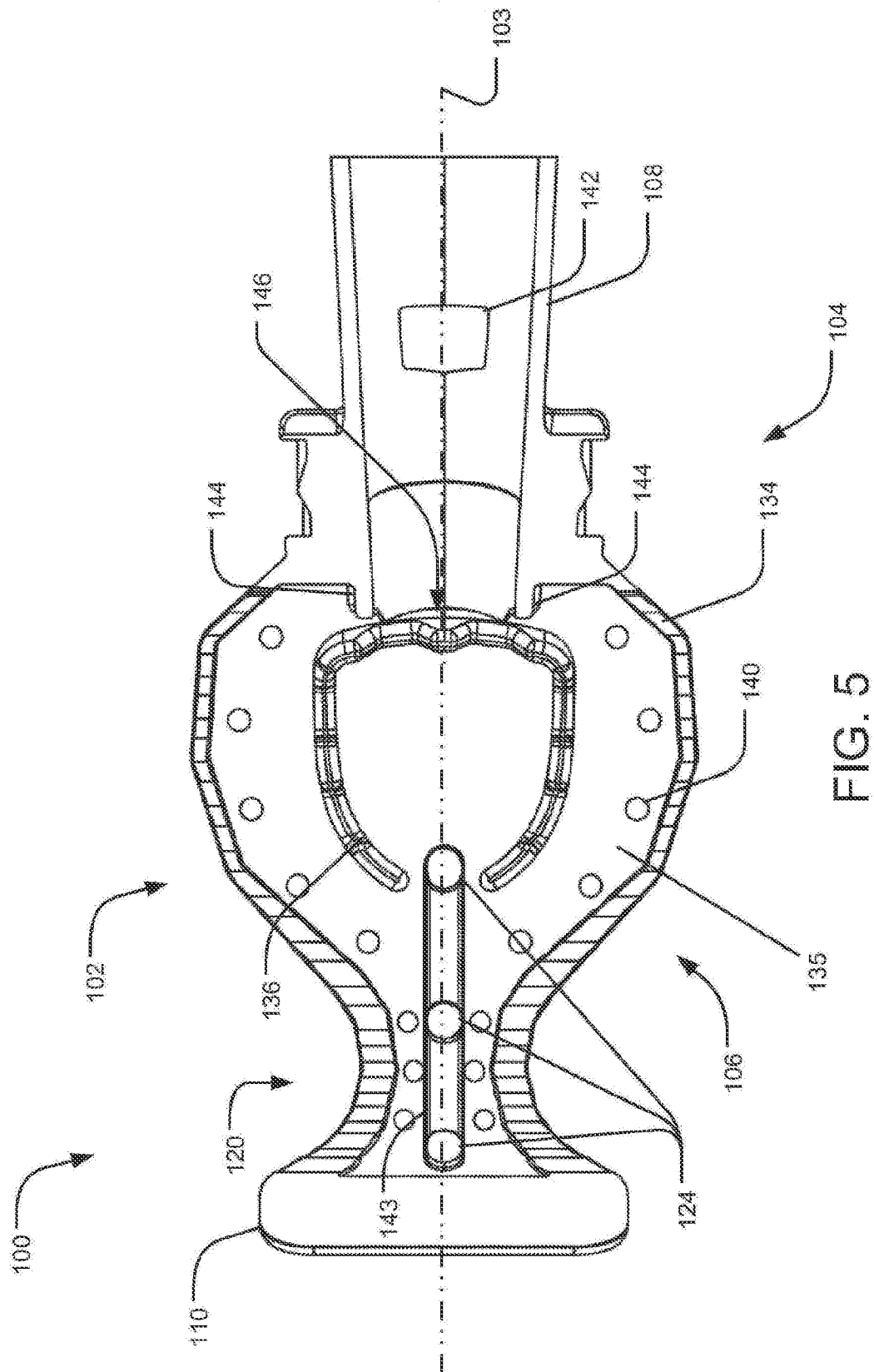


FIG. 4



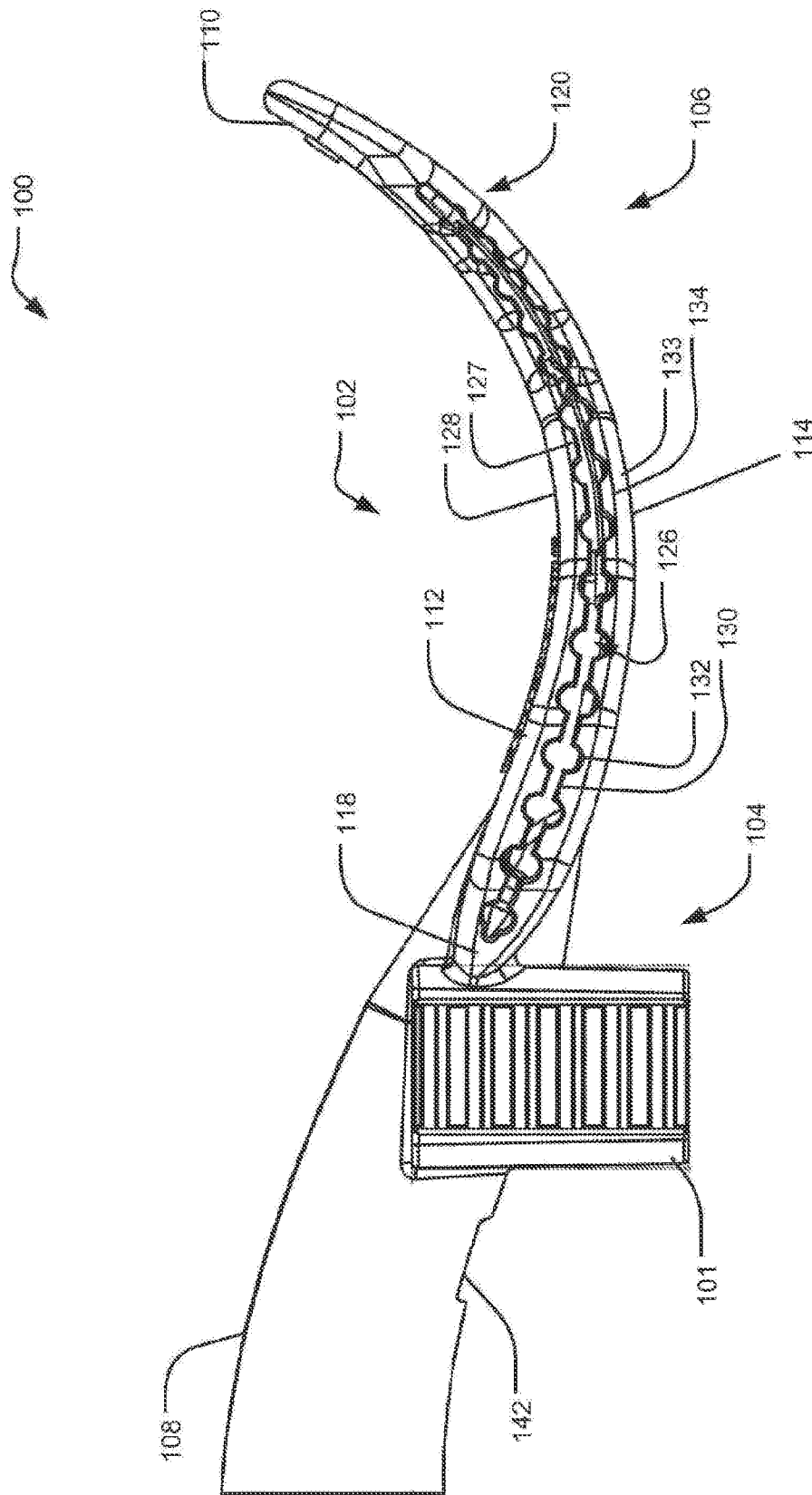
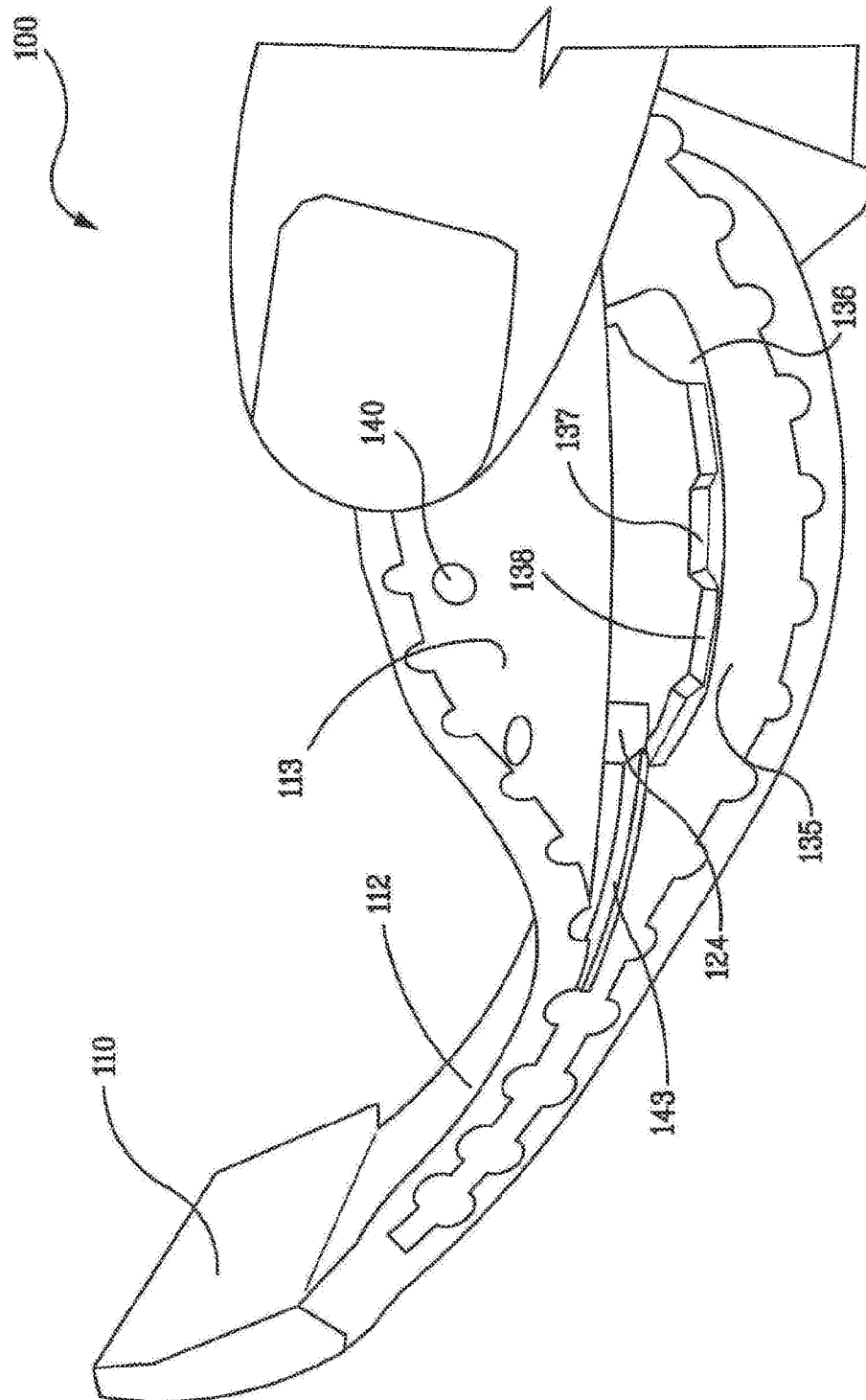
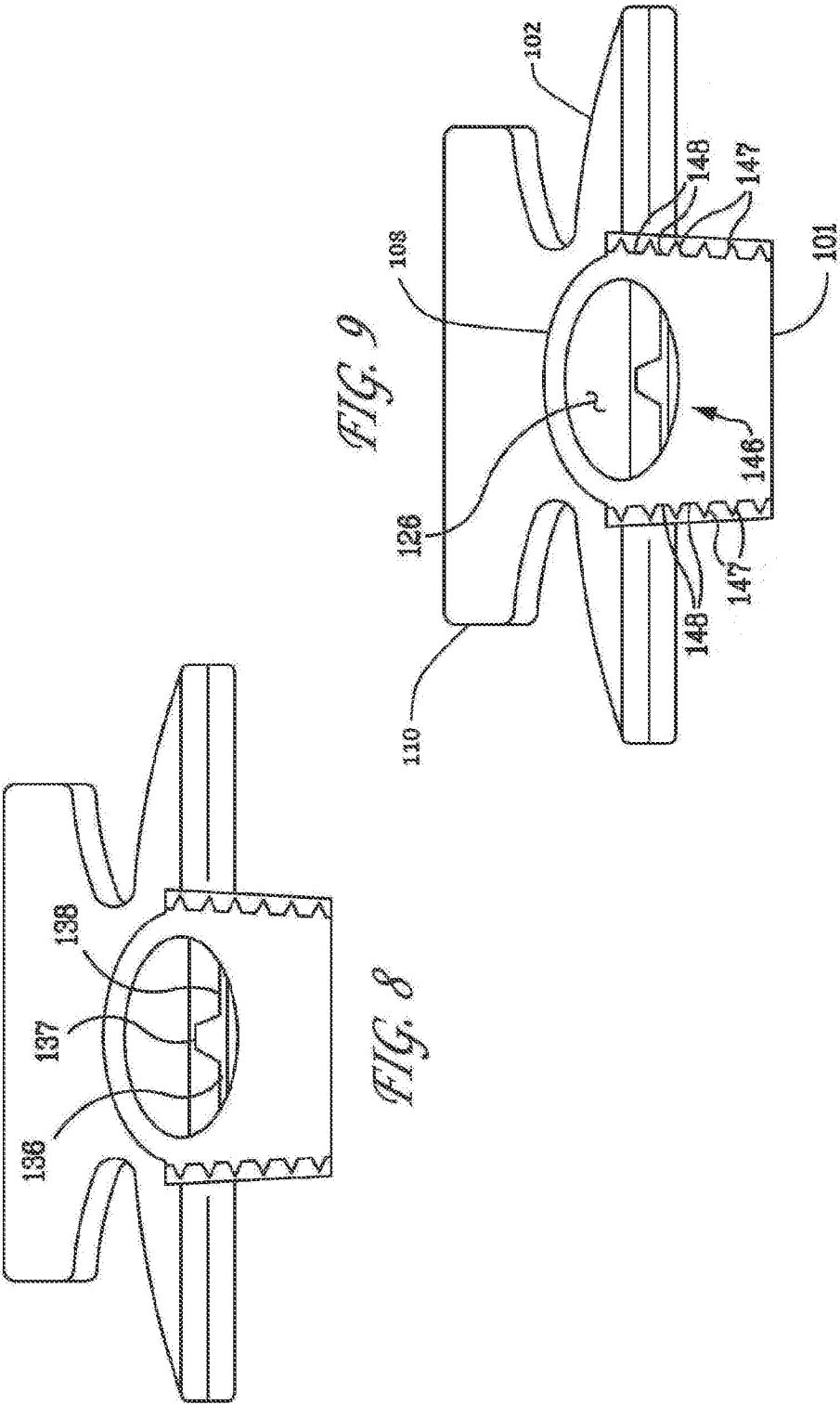


FIG. 6





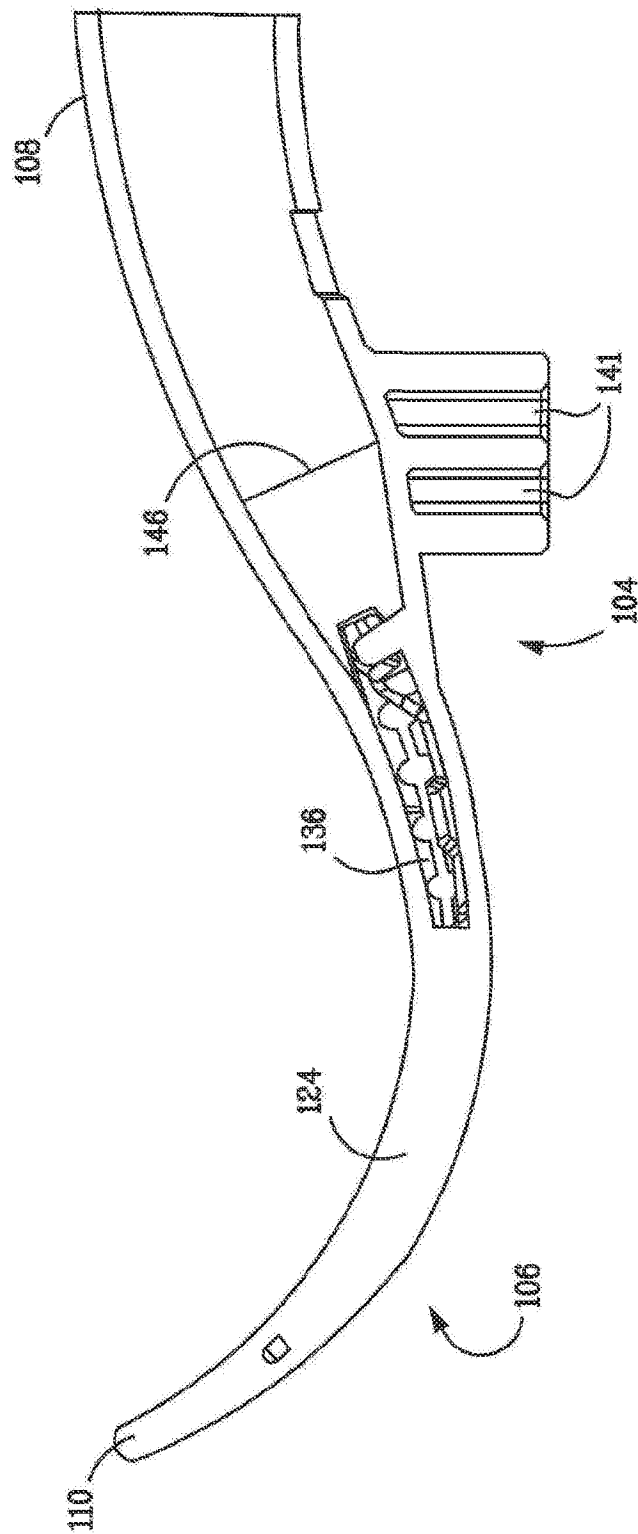


FIG. 10

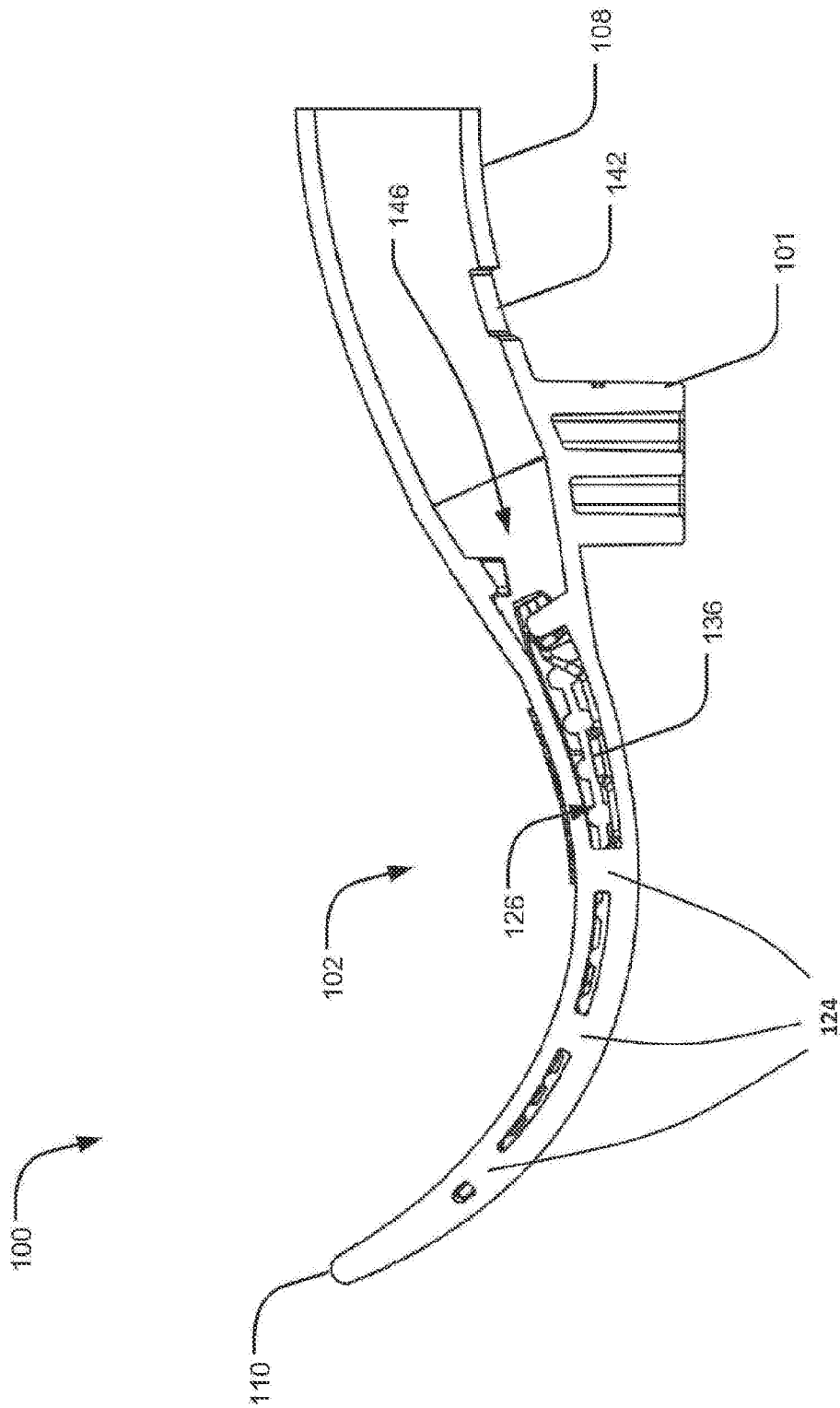


FIG. 11

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- US 20170156832 A1 [0003]
- US 20140212838 A1 [0004]
- US 20150335409 A1 [0005]

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

Applicants hereby declare, pursuant to 37 C.F.R. §1.97(e)(1), that each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement.

For the information disclosure statement (IDS) submitted herewith, the Applicant certifies the following with respect to the cumulative number of applicant-provided provided items of information submitted to date including those in the accompanying IDS (select only one):

- ☒ No IDS size fee is required under 37 CFR 1.17(v) at this time.
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(1).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(2).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(3).

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POLSINELLI LLP

Dated: February 6, 2025

By: /Tam Thanh Pham/
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
138718	7590	02/12/2025	EXAMINER	
Polsinelli LLP			APONTE, MIRAYDA ARLENE	
PO Box 140310			ART UNIT	PAPER NUMBER
Kansas City, MO 64114-0310			3772	
			NOTIFICATION DATE	DELIVERY MODE
			02/12/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocketing@polsinelli.com
sfpatent@polsinelli.com

<i>Applicant-Initiated Interview Summary</i>	Application No. 18/823,885	Applicant(s) Nguyen et al.		
	Examiner MIRAYDA A APONTE	Art Unit 3772	AIA (First Inventor to File) Status No	Page 1 of 2

All Participants (applicant, applicants representative, PTO personnel)	Title	Type
MIRAYDA A APONTE	Examiner	Telephonic
Jae Lee	Attorney of Record	
Tam Thanh Pham	Attorney of Record	

Date of Interview: 06 February 2025

Issues Discussed:

Proposed Amendment(s)

-The attorneys explained the proposed amendments and where the limitations described in claim 1 are located in the drawings, to overcome the 112(a) rejection with respect to the claimed "second wall including a wave-like structure" and the "plurality of perforations having at least five perforations".

-The Office explained that the figures and the specification do not provide clarity, by not showing nor describing that the wave-like structure is part of the second wall, as the limitation implies.

-With respect to the language of the "plurality of perforations having at least five perforations", the specification does not provide that minimum number of perforations required for device to work. Furthermore, the statement is considered an "open ended statement", where the statement includes unspecified upper values, in which creates an indefiniteness issue.

The attorney will take in consideration the position of the Office for the next amendments.
No final agreement was reached at this time.

☒ Attachment

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	
Applicant is reminded that a complete written statement as to the substance of the interview must be made of record in the application file. It is the applicants responsibility to provide the written statement, unless the interview was initiated by the Examiner and the Examiner has indicated that a written summary will be provided. See MPEP 713.04 Please further see: MPEP 713.04 Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews, paragraph (b) 37 CFR § 1.2 Business to be transacted in writing	

Applicant recordation instructions: The formal written reply to the last Office action must include the substance of the interview. (See MPEP section 713.04). If a reply to the last Office action has already been filed, applicant is given a non-extendable period of the longer of one month or thirty days from this interview date, or the mailing date of this interview summary form, whichever is later, to file a statement of the substance of the interview.

Examiner recordation instructions: Examiners must summarize the substance of any interview of record. A complete and proper recordation of the substance of an interview should include the items listed in MPEP 713.04 for complete

<i>Applicant-Initiated Interview Summary</i>	Application No. 18/823,885	Applicant(s) Nguyen et al.		
	Examiner MIRAYDA A APONTE	Art Unit 3772	AIA (First Inventor to File) Status No	Page 2 of 2

and proper recordation including the identification of the general thrust of each argument or issue discussed, a general indication of any other pertinent matters discussed regarding patentability and the general results or outcome of the interview, to include an indication as to whether or not agreement was reached on the issues raised.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Solmetex LLC

APPLICATION NO.: 18/823,885

INVENTOR(S): Nguyen et al.

FILED: September 4, 2024

TITLE: INTRAORAL DEVICE

EXAMINER: Mirayda Arlene Aponte

GROUP ART UNIT: 3772

CONFIRMATION NO.: 8808

ATTY. DKT. NO.: INCEP-001COH

INTERVIEW AGENDA

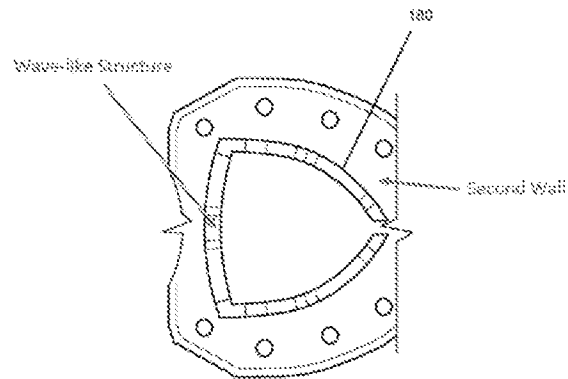
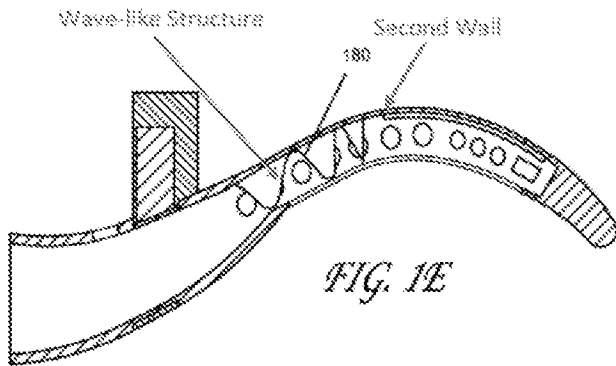
Examiner Aponte,

During the examiner interview scheduled on **February 6** at **1 pm** Eastern / **10 am** Pacific, Applicant wishes to discuss the following items.

I. Priority/Specification Objections/112(a) Rejections

MPEP § 2163.02 defines “Standard for Determining Compliance with the Written Description Requirement” and states that “[t]he subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement.” Further, “[a]n applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention.” *Id.*

- 'second wall including a wave-like structure'
- 'plurality of perforations having at least five perforations'



See U.S. Pat. No. 8,911,232 ('232 Patent), FIG. 1E (provided above); see also *id.* at 4:22 (referring to "internal wavelike bridge structure 180").

II. Proposed Amendment to Claim 1

1. (currently amended) An isolation mouthpiece for use with a suction system in a dental procedure, the isolation mouthpiece comprising:

a main body portion having a first end and a second end, the main body portion including:

a first wall having a first shape defined by a first edge and a second edge extending from the first end of the main body portion towards the second end of the main body portion,

a second wall having a second shape defined by third edge and a fourth edge extending from the first end of the main body portion towards the second end of the main body portion, the second wall including a first plurality of perforations extending along a portion of the third edge, and a second plurality of perforations extending along a portion of the fourth edge, the second wall further including a wave-like structure having a plurality of crests extending toward the first wall and a plurality of troughs, each of the plurality of troughs providing a gap between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs; and wherein the first wall and the second wall are shaped such that the first edge of the first wall corresponds in shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall; and wherein the ~~first wall and the second wall are shaped such that the first~~ [[edge]]

~~shape of the first wall corresponds to the second shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall, and~~

~~a third wall connecting the first wall and the second wall such that the first wall is spaced from the second wall to define an inner cavity, wherein a portion of the first wall has a first width adjacent to the first end of the main body portion and a second width adjacent to the second end of the main body portion, wherein a portion of the second wall has a third width adjacent to the first end of the main body portion and a fourth width adjacent to the second end of the main body portion, wherein the first width is greater than the second width, and wherein the third width is greater than the fourth width;~~

~~a suction connector portion extending from the first end of the main body portion, the suction connector portion including:~~

~~a generally tubular conduit including an opening extending through the conduit and in fluid communication with the inner cavity a gap of the wave-like structure, the opening being configured to receive a vacuum portion of the suction system therein, the generally tubular conduit further including a cutout configured to engage a protrusion on the suction system to aid in coupling the isolation mouthpiece to the suction system, and~~

~~a mouth prop including a first side and a second side that are inwardly tapered from a top surface of the mouth prop towards a bottom surface of the mouth prop, the first side and the second side each including a plurality of ridges; and~~

~~a cheek retractor portion having a first cheek-retractor end coupled to the second end of the main body portion and a second cheek-retractor end, the first cheek-retractor end and the second cheek-retractor end each having rounded edges.~~

Specification, [0040] (“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”).

If the Examiner has any questions regarding the case, the Examiner is invited to contact the Applicant’s undersigned representative.

Respectfully submitted,

February 7, 2025

By: /Tam Thanh Pham/
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Phone: (415) 248-2116
patentdocketing@polsinelli.com

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 18/823,885	Filing Date 09/04/2024	☐ To be Mailed
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ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED - PART I

	(Column 1)	(Column 2)	RATE (\$)	FEE (\$)
FOR	NUMBER FILED	NUMBER EXTRA		
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 = *		x \$40 =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 = *		x \$ 192 =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1)		(Column 2)	(Column 3)	RATE (\$)	ADDITIONAL FEE (\$)
AMENDMENT	02/12/2025	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA		
	Total (37 CFR 1.16(i))	* 28	Minus	** 28	= 0	x \$ 80 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	*** 3	= 0	x \$ 240 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x \$ 0 =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x \$ 0 =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.						LIE	
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".						/POLIN ANG/	
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The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.							

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ABSTRACT

A dental mouthpiece is provided 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. Such a mouthpiece may ~~comprise~~ include a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

INTRAORAL DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation and claims the priority benefit of U.S. patent application 18/679,097 filed May 30, 2024, which is a continuation and claims the priority benefit of U.S. patent application 18/217,304 filed June 30, 2023, now U.S. patent 12,011,329, which is a continuation and claims the priority benefit of U.S. patent application 14/228,057 filed March 27, 2014, now U.S. patent 11,744,686, which is a continuation and claims the priority benefit of U.S. patent application 14/100,323 filed December 9, 2013, now U.S. patent 8,911,232, which claims the priority benefit of U.S. provisional patent application number 61/734,939 filed December 7, 2012, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention generally relates to the field of dental mouthpieces. More specifically, the present invention relates to intraoral dental suction and isolation mouthpieces.

2. Description of Related Art

[0003] Various mouthpieces are currently used by dental health professionals, dental hygienists, and dental assistants in the field of dentistry. In the past, a dental patient has been treated by a traditional two-person team that comprises a dental professional and a dental assistant. Further, dental treatment may be provided by the team using many different types of dental equipment and materials. Such dental equipment and materials may include such items as an intraoral mirror, a bite block, a slow speed suction ejector, a high speed suction ejector, gauzes, cotton rolls, and dry angles. Each item of dental equipment may be used for different purposes, though some may be used in combination for some types of dental services. As such, a dental professional seeking to provide such dental services may need to use multiple items of such dental equipment. An important role of the dental assistant is therefore to assist the dental professional in coordinating the use of these multiple items of different equipment and materials.

[0004] There is, therefore, 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.

SUMMARY OF THE CLAIMED INVENTION

[0005] Embodiments of the present invention may include 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0006] The main body portion may comprise an enclosed pocket made up of an anterior wall, a posterior wall, and a side wall in between the anterior and posterior walls. The side wall may be perforated with a plurality of perforations. Such perforations may constitute a mesh. Additional perforations may be located on the anterior and posterior walls. The main body portion may further include a slit along a longitudinal, central axis on the anterior wall. Such openings (*e.g.*, perforations and slit) allow for suction of air, fluids, and small debris from the patient's mouth, through the openings into the interior portion, and into the suction connector portion towards a suction source. Because the mouthpiece is made of a flexible and resilient material (*e.g.*, silicone), the mouthpiece may be bent when placed in a patient's mouth to conform to the shape of the mouth. When properly positioned, the suction connector portion may protrude from one side of the patient's mouth, while the main body lies against the back of the patient's mouth, and the cheek retractor presses against the patient's cheek on the opposite side of the patient's mouth.

[0007] The main body may further include an protruding bridge structure on the interior surface of the posterior wall. Such a 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. Meanwhile, the troughs provide gaps that allow for suction of air, fluids, and small debris through the bridge structure.

BRIEF DESCRIPTION OF THE FIGURES

- [0008] FIG. 1A is a perspective view of an exemplary mouthpiece with a detachable mouth prop.
- [0009] FIG. 1B is a top view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0010] FIG. 1C is a bottom view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0011] FIG. 1D is a side view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0012] FIG. 1E is a cross-sectional view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0013] FIG. 2A is a perspective view of the exemplary mouthpiece of FIG. 1A where the detachable mouth prop has been detached.
- [0014] FIG. 2B is a top view of the exemplary mouthpiece of FIG. 2A.
- [0015] FIG. 2C is a bottom view of the exemplary mouthpiece of FIG. 2A.
- [0016] FIG. 2D is a side view of the exemplary mouthpiece of FIG. 2A.
- [0017] FIG. 2E is a cross-sectional view of the exemplary mouthpiece of FIG. 2A.
- [0018] FIG. 3A is a front view of an exemplary mouth prop.
- [0019] FIG. 3B is a back view of the exemplary mouth prop of FIG. 3A.
- [0020] FIG. 3C is a bottom view of the exemplary mouth prop of FIG. 3A.
- [0021] FIG. 3D is a perspective view of the exemplary mouth prop of FIG. 3A .
- [0022] FIG. 3E is a side view of the exemplary mouth prop of FIG. 3A.
- [0023] FIG. 3F is a top view of the exemplary mouth prop of FIG. 3A.
- [0024] FIG. 4 is a close-up view of exemplary mesh sides in an exemplary mouthpiece.
- [0025] FIG. 5 is a close-up view of an internal bridge in an exemplary mouthpiece.
- [0026] FIG. 6A is a close-up view of an exemplary reinforcing bar in an exemplary mouthpiece.
- [0027] FIG. 6B is a cross-sectional view of the exemplary reinforcing bar of FIG. 6A.
- [0028] FIG. 7A is a close-up view of an exemplary cheek retractor portion in an exemplary mouthpiece.

[0029] FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion of FIG. 7A.

DETAILED DESCRIPTION

[0030] Embodiments of the present invention provide for a mouthpiece comprising a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded as one-piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0031] FIGs. 1A-E are different views of an exemplary mouthpiece with an attachable mouth prop 160, while FIGs. 2A-E are different views of the exemplary mouthpiece of FIG. 1A where the attachable mouth prop 160 has been detached. Such a mouthpiece may include a main body portion 110, a suction connector portion 120, and a cheek retractor portion 130.

[0032] The main body portion 110 may include mesh or perforations 140, a stability bar 150, an open slit 170, and an internal bridge 180. The main body portion 110 may connect to a suction connector portion 120 on one end and a cheek retractor portion 130 at the other end. Such a cheek retractor portion 130 may be configured to press against and retract a patient's cheek away from the patient's teeth. When placed in a patient's mouth, the suction connector portion 120 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. The flexibility of the material used to form the mouthpiece allows for some bending when placed in the patient's mouth. The material is, however, resilient enough that the cheek retractor portion presses against the inside of the patient's cheek with such pressure being sufficient to move the cheek away from the patient's teeth.

[0033] An exemplary main body portion 110, when placed in a mouth, 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. The two walls may connect at a superior wall and an inferior wall forming a body that is at least partially enclosed.

Superior may be used herein to refer to the side that rests against a roof of a patient's mouth when placed therein, and inferior may be used to refer to the side that rests against the floor of the patient's mouth. The superior and inferior sides may be formed identically, which may allow for

the mouthpiece to change orientation such that the superior side may appear as the inferior side and vice versa, in the new orientation. When in use, the respective sides of the main body portion 110 may serve to protect and separate the top of the mouth and the bottom of the mouth/tongue. In addition, the main body portion 110 may also serve to protect the back of the mouth (*e.g.*, throat and airway) from falling debris.

[0034] Much of the main body portion 110 of the mouthpiece may be shaped as a straight-line arrowhead or shield whose base generally conforms to the intraoral shape of a patient's mouth. Differently-sized mouthpieces may be provided for differently-sized mouths of adults and children. Part of the base side of the arrowhead may be formed with thicker walls than the rest of the main body. Such thickening may provide additional stability.

[0035] In addition, the main body portion 110 of the mouthpiece may include a plurality of holes 140 distributed along the superior and inferior sides of the anterior and posterior walls to assist in suctioning of water, saliva and debris from the oral cavity. In some embodiments, a set of holes may also form a mesh along the walls of the superior and inferior edges. FIG. 4 is a close-up view of an exemplary mesh wall in an exemplary mouthpiece.

[0036] At the narrow end of the arrowhead that connects to the cheek retractor portion 130, the main body portion 110 may include a rectangular portion. Narrower than the base of the arrowhead, the rectangle may additionally include a reinforcing bar (or stability bar) 150 (described in further detail below) and may be at least partially crossed by a slit 170 (described in further detail below) into the interior of the pocket of the main body portion 110.

[0037] Stability bar 150 may be a protrusion or otherwise a thickened area that reinforces the stability of the rectangular portion and assist in shaping this region to the intraoral posterior shape of a patient's mouth. FIG. 6A is a close-up view of an exemplary stability bar 150 of an exemplary mouthpiece. FIG. 6B is a cross-sectional view of the exemplary reinforcing bar in the cheek retractor connector portion of FIG. 6A.

[0038] In some embodiments, the internal, rectangular-shaped reinforcing or stability bar 150 may be located distally to the internal wavelike bridge structure 180 and attached to both the interior side of the posterior surface of the main body and the rectangular portion. Such a stability bar 150 may be located in the area where a positioned mouthpiece begins to wrap from the lingual side of the most posterior mandibular tooth, around the distal side of the most posterior tooth, and to anterior side of the most posterior mandibular tooth, thereby assisting in shaping the mouthpiece to the general intraoral shape of a patient's mouth.

[0039] Various embodiments of the mouthpiece may further include a longitudinal, open slit 170 extending over approximately two-thirds of the main body on the anterior surface. Running along the center of the main body across the rectangle and most of the arrowhead, such a slit 170 may assist in capture and suction of water, saliva and debris, as well as assisting in cleaning and maintenance.

[0040] Additionally, the main body of the mouthpiece may include a bridge structure 180 on an interior surface to ensure that the anterior and posterior surfaces remain separated during suction. FIG. 1E is a cross-sectional view of the mouthpiece in which the bridge structure 180 is illustrated. FIG. 5 is a close-up view of the bridge structure 180 without the surrounding walls of the main body portion. Such a bridge structure 180 may be formed as an 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. In some embodiments, the bridge structure 180 may be centrally-located in the main body portion 110 of the mouthpiece. 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. In some embodiments, the bridge structure 180 may follow the shape of a logo (*e.g.*, an arrowhead or shield).

[0041] The suction connector portion 120 may be oval-shaped and also attached to the main body portion 110. The suction connector portion 120 may be formed with thicker walls than the main body portion 110 and 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. The suction connector portion 120 may also include an internal stop to assist in sliding the mouthpiece onto the adapter to a desired depth. The suction connector portion 120 may additionally have an external, concave, notched region 210 that corresponds to a removable strap such that when the strap is in place, the external walls of the strap and the rest of the connector portion may be flush.

[0042] The cheek retractor portion 130 is illustrated as a hammerhead distal region, which may be attached to the main body portion 110. FIG. 7A is a close-up view of an exemplary cheek retractor portion 130 in an exemplary mouthpiece. FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion 130 of FIG. 7A.

[0043] The mouthpiece may be used with a mouth prop 160, as illustrated in FIGs. 1 (with a mouth prop 160) and FIGs. 2 (illustrated without the mouth prop 160). FIGs. 3A-E provide different close-up views of an exemplary mouth prop 160. The removable strap 310 may be

attached to portion 320 of mouth prop 160, which may be used to prop open a patient's mouth and teeth. In this regard, the suction connector portion 120 may additionally have an external plug 220 (FIG. 2C) protruding from the posterior side of the suction connector portion 120. Such a plug 220 may correspond to and serve to connect with an opening in the mouth prop 160. The mouth prop 160 may be reinforced by the presence of the plug 220 in the opening, thereby resulting in a more crush-resistant, nearly incompressible, and stable mouth prop 160. In some embodiments, the suction connector portion 120 may further have a cutout 230 (*e.g.*, which may be shaped as a logo) providing extra interlocking with a corresponding protrusion (*e.g.*, which may also be shaped as a logo) on an external high-suction vacuum adapter.

[0044] The mouth prop 160 may be made of thickened silicone material injection molded in a single piece with an elastic strap corresponding to the circumference of the suction connector portion. The mouth prop 160 has an internal, rectangular-shaped female slot designed to fit snugly with the external, rectangular-shaped male plug 220 of the suction connector portion 120 of the mouthpiece. Mouth props may be made in different sizes for differently sized mouths. Because the mouth prop and mouthpiece are detachable from each other, different sizes of each may be mixed and matched as needed for a particular patient's mouth.

[0045] The mouthpiece as described herein may be used with a one-piece, autoclavable, high-suction vacuum adapter. Such a high-suction vacuum body adapter may be made of a single homogenous material. Having a single lever design, such a vacuum adapter may function in the same manner as all the current high-suction vacuum evacuators and saliva ejectors in controlling the removal of water, saliva, and debris from the oral cavity to the outside vacuum source. The single lever may be designed to control the removal of water, saliva, and debris from the at least partially enclosed so main body through a single, large evacuation conduit within the suction connector portion.

[0046] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. The descriptions are not intended to limit the scope of the invention to the particular forms set forth herein. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above-described exemplary embodiments. It should be understood that the above description is illustrative and not restrictive. To the contrary, the present descriptions are intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims and otherwise appreciated by one of ordinary skill in the art. The scope of the invention should, therefore, be determined not with reference to the above

description, but instead should be determined with reference to the appended claims along with their full scope of equivalents.



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PATENT AND TRADEMARK OFFICE

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INTRAORAL DEVICE

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INVENTOR Thien Nguyen

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Documents

TOTAL DOCUMENTS: 11

DOCUMENT		PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH Amendment A.pdf		17	-	252 KB
INCEP-001COH Amendment A-A....pdf	(1-1)	1	Amendment/Request for Reconsideration-After Non- Final Rejection	122 KB
INCEP-001COH Amendment A-SPEC.pdf	(2-2)	1	Specification	114 KB
INCEP-001COH Amendment A-CLM.pdf	(3-10)	8	Claims	114 KB
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Amendment A-REM.pdf		Made in an Amendment	
INCEP-001COH_Substitute Specification_Clean- SPEC.docx	10	Specification	27 KB
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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Solmetex, LLC
INVENTOR(S): Thien Nguyen et al.
APPLICATION NO.: 18/823,885
FILED: September 4, 2024
TITLE: Intraoral Device
EXAMINER: Mirayda Arlene Aponte
ART UNIT: 3772
CONF. NO.: 8808
ATTY. DKT. NO.: INCEP-001COH

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AMENDMENT A

Examiner Aponte:

In response to the non-final office action dated November 21, 2024 (*Office Action*), the Applicant respectfully requests reconsideration and allowance of the application in view of the following amendments and remarks. **Amendments to the specification** begin on page **two**. **Amendments to the claims** begin on page **three**. A **summary of the examiner interview** begins on **page eleven**. The **remarks** and **conclusion** begin on pages **twelve** and **seventeen**, respectively.

IN THE SPECIFICATION

PLEASE AMEND THE ABSTRACT AS FOLLOWS:

A dental mouthpiece is provided 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. Such a mouthpiece may ~~comprise~~ include a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

PLEASE AMEND THE SPECIFICATION AS FOLLOWS:

[0043] The mouthpiece may be used with a mouth prop 160, as illustrated in FIGs. 1 (with a mouth prop 160) and FIGs. 2 (illustrated without the mouth prop 160). FIGs. 3A-E provide different close-up views of an exemplary mouth prop 160. The removable strap 310 may be attached to portion 320 of mouth prop 160, which may be used to prop open a patient's mouth and teeth. In this regard, the suction connector portion 120 may additionally have an external plug 220 (FIG. 2C) protruding from the posterior side of the suction connector portion 120. Such a plug 220 may correspond to and serve to connect with an opening in the mouth prop 160. The mouth prop 160 may be reinforced by the presence of the plug 220 in the opening, thereby resulting in a more crush-resistant, nearly incompressible, and stable mouth prop 160. In some embodiments, the suction connector portion 120 may further have a cutout 230 (*e.g.*, which may be shaped as a logo) providing extra interlocking with a corresponding protrusion (*e.g.*, which may also be shaped as a logo) on an external high-suction vacuum adapter.

IN THE CLAIMS

PLEASE AMEND THE CLAIMS AS FOLLOWS:

1. (currently amended) An isolation mouthpiece for use with a suction system in a dental procedure, the isolation mouthpiece comprising:

a main body portion having a first end and a second end, the main body portion including:

a first wall having a first shape defined by a first edge and a second edge extending from the first end of the main body portion towards the second end of the main body portion,

a second wall having a second shape defined by third edge and a fourth edge extending from the first end of the main body portion towards the second end of the main body portion, the second wall including a first plurality of perforations extending along a portion of the third edge, and a second plurality of perforations extending along a portion of the fourth edge, ~~the second wall further including wherein a plurality of~~ crests of a wave-like structure having a plurality of crests extending toward is formed on an interior surface of the second wall to provide contact points with the first wall, and a plurality of troughs[[,]] of the wave-like structure ~~each of the plurality of troughs providing a gap provides gaps~~ between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs; and wherein the first wall and the second wall are shaped such that the first edge of the first wall corresponds in shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall; and wherein the ~~first wall and the second wall are shaped such that the first~~ [[edge]] shape of the first wall corresponds ~~[[in]] to the second~~ shape to the third edge of the second wall ~~and the second edge of the first wall corresponds in shape to the fourth edge of the second wall,~~ and

a third wall connecting the first wall and the second wall such that the first wall is spaced from the second wall ~~to define an inner cavity~~, wherein a portion of the first wall has a first width adjacent to the first end of the main body portion and a second width adjacent to the second end of the main body portion, wherein a portion of the second wall has a third width adjacent to the first end of the main body portion and a fourth width adjacent to the second end of the main body portion, wherein the first width is greater than the second width, and wherein the third width is greater than the fourth width;

a suction connector portion extending from the first end of the main body portion, the suction connector portion including:

a ~~generally~~ tubular conduit including an opening extending through the conduit and in fluid communication with the ~~inner cavity~~ plurality of troughs of the wave-like structure, the opening being configured to receive a vacuum portion of the suction system therein, the ~~generally~~ tubular conduit further including a cutout configured to engage a protrusion on the suction system to aid in coupling the isolation mouthpiece to the suction system, and

a mouth prop including a first side and a second side that are inwardly tapered from a top surface of the mouth prop towards a bottom surface of the mouth prop, the first side and the second side each including a plurality of ridges; and

a cheek retractor portion having a first cheek-retractor end coupled to the second end of the main body portion and a second cheek-retractor end, the first cheek-retractor end and the second cheek-retractor end each having rounded edges.

2. (currently amended) The isolation mouthpiece of claim 1, wherein the first plurality of perforations includes ~~at least~~ five perforations and the second plurality of perforations include ~~at least~~ five perforations.

3. (currently amended) The isolation mouthpiece of claim 2, wherein at least one of the first plurality of perforations and at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.

4. (currently amended) The isolation mouthpiece of claim 1, wherein the first wall and the second wall of the main body portion transition into and are connected in the cheek retractor portion to form the cheek retractor portion, the first wall and the second wall of the main body portion that transition into the cheek retractor portion are spaced apart from each other for a distance within the cheek retractor portion before being connected to each other in the cheek retractor portion.

5. (currently amended) The isolation mouthpiece of claim 4, wherein at least one of the first plurality of perforations and at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.

6. (currently amended) The isolation mouthpiece of claim 1, wherein the cutout has a shield shape.

7. (currently amended) The isolation mouthpiece of claim 1, wherein the cutout has a ~~generally~~ triangular shape.

8. (currently amended) The isolation mouthpiece of claim 1, further including a stability bar located along a center aligned with a longitudinal axis of the first wall at least adjacent to the second end of the main body, at least one of the first plurality of perforations being positioned ~~[[on]]~~ along one ~~[[side]]~~ edge of the ~~stability bar~~ second wall and at least one of the second plurality of perforations being positioned ~~[[on]]~~ along another ~~[[side]]~~ edge of the ~~stability bar~~ second wall.

9. (currently amended) The isolation mouthpiece of claim 8, wherein the stability bar extends upwardly from the ~~first~~ second wall toward the ~~second~~ first wall.

10. (currently amended) The isolation mouthpiece of claim 9, wherein the stability bar does not contact the ~~second~~ first wall.

11. (currently amended) An isolation mouthpiece for use with a suction system in a dental procedure, the isolation mouthpiece comprising:

a main body portion having a first end and a second end, the main body portion including:

a first wall having a first shape defined by first edge and a second edge extending from the first end of the main body portion towards the second end of the main body portion,

a second wall having a second shape defined by third edge and a fourth edge extending from the first end of the main body portion towards the second end of the main body portion, the second wall including a first plurality of perforations extending along a portion of the third edge, and a second plurality of perforations extending along a portion of the fourth edge, wherein ~~the second wall further including a plurality of~~ crests of a wave-like structure having a plurality of crests extending toward is formed on an interior surface of the second wall to provide contact points with the first wall, and a plurality of troughs[~~[,]~~] of the wave-like structure ~~each of the plurality of troughs providing a gap~~ provides gaps between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs, and

a third wall connecting the first wall and the second wall such that the first wall is spaced from the second wall ~~to define an inner cavity~~, wherein a portion of the first wall has a first width adjacent to the first end of the main body portion and a second width adjacent to the second end of the main body portion, wherein a portion of the second wall has a third width adjacent to the first end of the main body portion and a fourth width adjacent to the second end of the main body portion, wherein the first

width is greater than the second width, and wherein the third width is greater than the fourth width;

a suction connector portion extending from the first end of the main body portion, the suction connector portion including:

a ~~generally~~ tubular conduit including an opening extending through the conduit and in fluid communication with the ~~inner cavity~~ the plurality of troughs of the wave-like structure, the opening being configured to receive a vacuum portion of the suction system therein, and

a mouth prop including a first side and a second side that are inwardly tapered from a top surface of the mouth prop towards a bottom surface of the mouth prop, the first side and the second side each including a plurality of ridges; and

a cheek retractor portion having a first cheek-retractor end coupled to the second end of the main body portion and a second cheek-retractor end, the first cheek-retractor end and the second cheek-retractor end each having rounded edges, wherein the first wall and the second wall of the main body portion that transition into the cheek retractor portion are spaced apart from each other for a distance within the cheek retractor portion before being connected to each other in the cheek retractor portion.

12. (currently amended) The isolation mouthpiece of claim 11, wherein the ~~generally~~ tubular conduit includes a cutout configured to engage a protrusion on the suction system to aid in coupling the isolation mouthpiece to the suction system.

13. (currently amended) The isolation mouthpiece of claim 11, wherein the first plurality of perforations includes ~~at least~~ five perforations and the second plurality of perforations include ~~at least~~ five perforations.

14. (currently amended) The isolation mouthpiece of claim 13, wherein the at least one of the first plurality of perforations and the at least one of the second plurality of perforations are located adjacent to the second end and near the cheek retractor portion.

15. (currently amended) The isolation mouthpiece of claim 11, wherein the first wall and the second wall are shaped such that the first edge of the first wall corresponds in shape to the third edge of the second wall and the second edge of the first wall corresponds in shape to the fourth edge of the second wall.

16. (currently amended) The isolation mouthpiece of claim 11, further including a stability bar located along a center aligned with a longitudinal axis of the first wall at least adjacent to the second end of the main body, at least one of the first plurality of perforations being positioned ~~[[on]]~~ along one ~~[[side]]~~ one ~~[[side]]~~ edge of the ~~stability bar~~ second wall and at least one of the second plurality of perforations being positioned ~~[[on]]~~ along another ~~[[side]]~~ edge of the ~~stability bar~~ second wall.

17. (currently amended) The isolation mouthpiece of claim 16, wherein the stability bar extends upwardly from the ~~first~~ second wall toward the ~~second~~ first wall.

18. (currently amended) The isolation mouthpiece of claim 17, wherein the stability bar does not contact the ~~second~~ first wall.

19. (currently amended) The isolation mouthpiece of claim 11, wherein a wall thickness within the suction connector portion is greater than a wall thickness of the first wall or the second wall of the main body.

20. (currently amended) A mouthpiece comprising:

a main body having a first end opposite a second end that is narrower than the first end,
the main body comprising:

a first wall that extends from the first end to the second end, wherein the first wall includes a plurality of first edges,

a second wall that extends from the first end to the second end, wherein the first wall and the second wall define an interior space therebetween, and wherein the second wall includes[[:] a plurality of second edges, ~~a plurality of perforations that open into the interior space between the first wall and the second wall, and a portion configured in a wave shape having one or more~~ wherein a plurality of crests ~~that extend towards and is formed on an interior surface of the second wall to~~ provide a plurality of contact points with the first wall, ~~and wherein a plurality of one or more~~ troughs ~~[[that]]~~ provide a plurality of gaps through which fluids can pass between the contact points, wherein the ~~portion is~~ contact points are not attached to the first wall; and

a third wall that connects one of the first edges of the first wall to one of the second edges of the second wall; and

a cheek retractor portion extending from the second end and connected to the first wall and the second wall of the main body.

21. (original) The mouthpiece of claim 20, further comprising a suction connector extending from the first end of the main body, wherein an evacuation conduit within the suction connector is in communication with the interior space between the first wall and the second wall.

22. (original) The mouthpiece of claim 21, wherein the suction connector further includes a cutout configured to interlock with a corresponding protrusion of a vacuum adapter.

23. (original) The mouthpiece of claim 20, further comprising a stability bar corresponding to a thickened area of the main body, the stability bar extending along a longitudinal axis of the main body between the first wall and the second wall, wherein a thickness of the stability bar reinforces at least a portion of the main body.

24. (original) The mouthpiece of claim 20, wherein a material used to form the main body is a flexible, translucent, high heat-resistant, autoclavable silicone-based material.

25. (original) The mouthpiece of claim 20, further comprising a mouth prop injection-molded in one piece.

26. (original) The mouthpiece of claim 25, wherein the mouth prop is connected to a suction connector.

27. (original) The mouthpiece of claim 26, wherein at least one of the cheek retractor and the suction connector is integral with the main body.

28. (currently amended) The mouthpiece of claim 20, wherein the plurality of perforations are distributed along one or more of the second edges of the second wall.

SUMMARY OF EXAMINER INTERVIEW

An examiner interview (*Interview*) was conducted on February 6, 2025 between Examiner Aponte and Applicant's representatives, Tam Thanh Pham and Hyeok Jae Lee. The *Interview* included discussion of various proposed amendments to the claims and specification support for the same, which were agreed upon as overcoming certain rejections of record in the *Office Action*. The Examiner was invited to contact the Applicant's representatives regarding any further amendments that would place the application into condition for allowance.

The undersigned thanks the Examiner for her time, courtesy, and feedback. The present response is submitted with amendments in accordance with the *Interview*, and Applicant respectfully requests entry and consideration of the same.

REMARKS

Status of the Claims

Claims 1-28 are pending in the present application. Claims 1-19, and 28 are currently amended. All amendments are supported by the specification as discussed in further detail herein. No new matter is added. The Applicant respectfully requests entry and allowance of the same.

Priority, Specification, and Rejections under 35 U.S.C. § 112(a)

The Examiner purports to identify various issues regarding the priority claim to U.S. patent number 8,911,232 ('232 Patent), objections to the specification (*Specification*), and written description in relation to the same claim elements (e.g., 'wave-like structure,' 'at least five perforations,' and 'stability bar'). See e.g., *Office Action*, 2-5. Applicant does not necessarily agree with the objections and rejections, however, and amendments to the claims are submitted merely to expedite allowance and grant

During the *Interview*, Applicant's representatives discussed the claim amendments, which were agreed upon as expressly supported by teachings in the '232 Patent and corresponding *Specification*, including at least following provided here for the Examiner's reference:

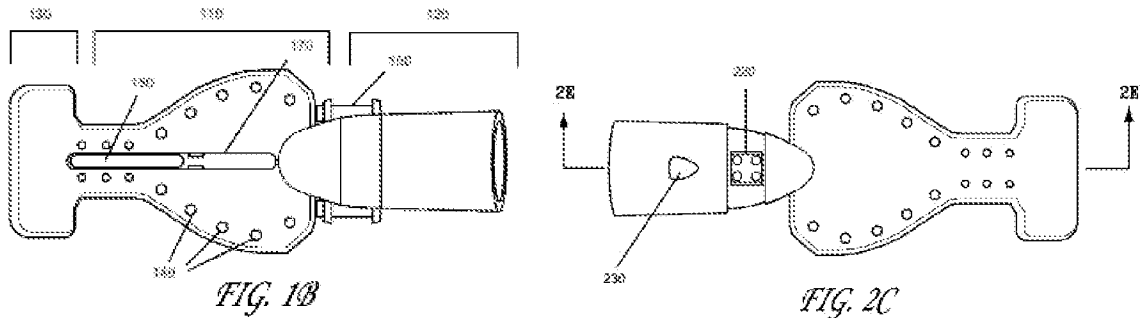
The main body may further include an protruding bridge structure *on the interior surface of the posterior wall*. Such a bridge structure may protrude from the interior surface in a wave shape with crests and troughs. The crests provide a plurality of *contact points with the anterior wall* to keep the anterior wall separated from the posterior wall during suction. Meanwhile, the *troughs provide gaps* that allow for suction of air, fluids, and small debris through the bridge structure.

'232 Patent, 2:10-16; *Specification*, [0007].

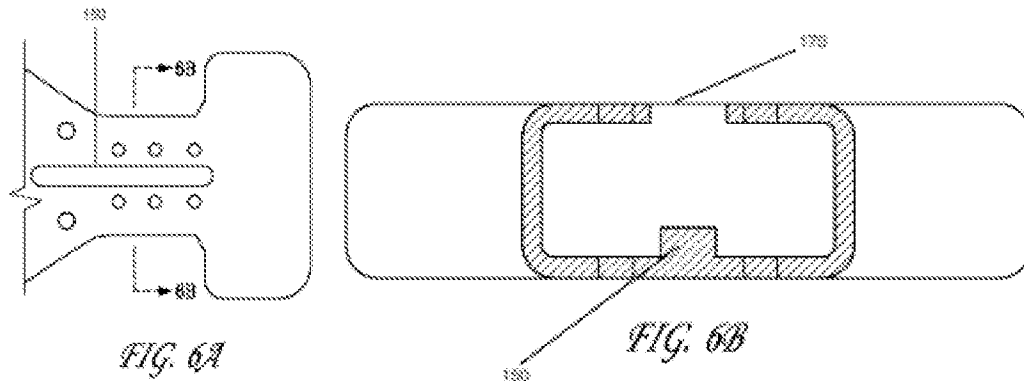
Such a bridge *structure 180 may be formed as an wave-like* protrusion that generally corresponds to the distance between the anterior and posterior walls extending substantially (e.g., within 1 mm) the full distance at its crest and substantially flush to the surface at its trough. In some embodiments, the bridge

structure 180 may be centrally-located in the main body portion 110 of the mouthpiece. 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.

'232 Patent, 4:44-54; *Specification*, [0040].



'232 Patent at FIGs. 1B, 2C; *Specification* at FIGs. 1B, 2C (illustrating at least five “perforations 140”).



'232 Patent at FIGs. 6A-B; *Specification* at FIGs. 6A-B (illustrating “stability bar 150” shown as not contacting the first wall).

It was agreed during the *Interview* that the amendments tracked the express teachings of the '232 Patent and *Specification* and thus resolve the objections and rejections raised in relation to priority, specification, and written description. See also MPEP § 2163.02 (defining “Standard for Determining Compliance with the Written Description Requirement” in noting that “[a]n applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and

formulas that fully set forth the claimed invention,” and that “[t]he subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement”).

Based on the foregoing, the Applicant respectfully requests that the priority date of the ‘232 patent be accorded to the present application and that the objections to the specification be withdrawn, as well as submits that the written description rejections under 35 U.S.C. § 112(a) are overcome.

Drawings

The drawings are objected to as purportedly failing to comply with 37 CFR 1.84(p)(5) because the reference number 320 of FIG. 3A is not found in the specification. *Office Action* at 3. To expedite examination, paragraph [0043] of the specification has been amended in compliance with 37 CFR 1.121(b). Clean and marked-up substitute *Specifications* with the amendments are also provided herewith. Withdrawal of the objection to the drawings is respectfully requested.

Objections to the Specification

The Examiner objects to the abstract because of the use of legal phraseology (*i.e.*, “comprise”). *Office Action* at 3. The abstract as presented herein no longer recites “comprise,” thus rendering this objection moot.

The Examiner further objects to the term ‘generally’ (in ‘generally tubular conduit’) in claims 1 and 11. *Id.* Applicant does not necessarily agree with the objection, however, and amendments to the claims are submitted merely to expedite allowance and grant. The term ‘generally’ no longer appears in claims 1 and 11 as presented herein, thus rendering this objection moot.

Based on the foregoing, withdrawal of the remaining objections to the specification is respectfully requested.

Rejections under 35 U.S.C. § 112(b)

Claims 1-19 and 28 are rejected under 35 U.S.C. § 112(b) as allegedly indefinite in relation to use of ‘generally’ (claims 1 and 11), ‘center,’ and ‘on’ (claims 8 and 16). *Office Action*, 5. Applicant does not necessarily agree with the rejections, and amendments to the claims are submitted merely to expedite allowance and grant.

The term ‘generally’ no longer appears in claims 1 and 11 as presented herein, thus rendering this rejection moot.

The examiner purports that it is unclear as to “what center the applicant refers to” in claims 8 and 16, whether “aligned with the longitudinal axis,” “aligned with the center of the isolation mouth piece, etc.” *Id.* As presented herein, claims 8 and 16 recite a ‘center aligned with a longitudinal axis.’ The rejections are thus overcome.

The examiner purports that the claimed ‘perforations being positioned on one side of the stability wall’ could be “interpreted that the perforations are on the stability bar, not on the second wall.” *Id.* at 6. As presented herein, claims 8 and 16 recite ‘at least one of the first plurality of perforations being positioned along one edge of the second wall and at least one of the second plurality of perforations being positioned along another edge of the second wall.’ *See* ‘232 Patent at 3:64-4:1 (describing “holes 140 distributed along the superior and inferior sides of the anterior and posterior walls” and that the “set of holes may also form a mesh along the walls of the superior and inferior edges”). The rejections are thus overcome.

The examiner purports that ‘perforations’ recited by claim 28 “is confusing,” as “[i]t is not understood if the term refers to the ‘plurality of perforations’.” *Id.* at 6. As presented, claim 28 now recites ‘plurality of perforations,’ and the rejections are thus overcome.

Based on the foregoing, withdrawal of the rejections of claims 1-19 and 28 under 35 U.S.C. § 112(b) is respectfully requested.

Claim Objections

The Examiner objects to Claims 1-19 because of purported informalities in use of ‘mouthpiece’ and ‘isolation mouthpiece.’ *Id.* Although “[t]he Office understands that the both [sic] terms refer to the same limitation,” “it is suggested to maintain the same nomenclature across the claims to avoid potential confusion.” *Id.* Applicant notes that as presented herein, the claims no longer include the identified informalities. Thus, it is believed that the objections are moot, and the Applicant respectfully requests withdrawal of the same.

CONCLUSION

The undersigned submits that each of the pending claims are allowable in light of the responses made herein. Accordingly, the undersigned requests reconsideration of the rejections and objections levied and ultimately allowance of the pending claims.

If the Examiner has any questions regarding the case, the Examiner is invited to contact the Applicant's undersigned representative.

Respectfully submitted,

February 12, 2025

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ABSTRACT

A dental mouthpiece is provided 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. Such a mouthpiece may include a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

ABSTRACT

A dental mouthpiece is provided 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. Such a mouthpiece may include a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

INTRAORAL DEVICE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application is a continuation and claims the priority benefit of U.S. patent application 18/679,097 filed May 30, 2024, which is a continuation and claims the priority benefit of U.S. patent application 18/217,304 filed June 30, 2023, now U.S. patent 12,011,329, which is a continuation and claims the priority benefit of U.S. patent application 14/228,057 filed March 27, 2014, now U.S. patent 11,744,686, which is a continuation and claims the priority benefit of U.S. patent application 14/100,323 filed December 9, 2013, now U.S. patent 8,911,232, which claims the priority benefit of U.S. provisional patent application number 61/734,939 filed December 7, 2012, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention generally relates to the field of dental mouthpieces. More specifically, the present invention relates to intraoral dental suction and isolation mouthpieces.

2. Description of Related Art

[0003] Various mouthpieces are currently used by dental health professionals, dental hygienists, and dental assistants in the field of dentistry. In the past, a dental patient has been treated by a traditional two-person team that comprises a dental professional and a dental assistant. Further, dental treatment may be provided by the team using many different types of dental equipment and materials. Such dental equipment and materials may include such items as an intraoral mirror, a bite block, a slow speed suction ejector, a high speed suction ejector, gauzes, cotton rolls, and dry angles. Each item of dental equipment may be used for different purposes, though some may be used in combination for some types of dental services. As such, a dental professional seeking to provide such dental services may need to use multiple items of such dental equipment. An important role of the dental assistant is therefore to assist the dental professional in coordinating the use of these multiple items of different equipment and materials.

[0004] There is, therefore, a need in the art for improved systems and methods of providing

Substitute Specification - Marked Up

dental services in a more efficient, comfortable, and safe manner to the dental patient.

SUMMARY OF THE CLAIMED INVENTION

[0005] Embodiments of the present invention may include 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. Such a mouthpiece may comprise a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded in one piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0006] The main body portion may comprise an enclosed pocket made up of an anterior wall, a posterior wall, and a side wall in between the anterior and posterior walls. The side wall may be perforated with a plurality of perforations. Such perforations may constitute a mesh. Additional perforations may be located on the anterior and posterior walls. The main body portion may further include a slit along a longitudinal, central axis on the anterior wall. Such openings (*e.g.*, perforations and slit) allow for suction of air, fluids, and small debris from the patient's mouth, through the openings into the interior portion, and into the suction connector portion towards a suction source. Because the mouthpiece is made of a flexible and resilient material (*e.g.*, silicone), the mouthpiece may be bent when placed in a patient's mouth to conform to the shape of the mouth. When properly positioned, the suction connector portion may protrude from one side of the patient's mouth, while the main body lies against the back of the patient's mouth, and the cheek retractor presses against the patient's cheek on the opposite side of the patient's mouth.

[0007] The main body may further include an protruding bridge structure on the interior surface of the posterior wall. Such a 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. Meanwhile, the troughs provide gaps that allow for suction of air, fluids, and small debris through the bridge structure.

BRIEF DESCRIPTION OF THE FIGURES

- [0008] FIG. 1A is a perspective view of an exemplary mouthpiece with a detachable mouth prop.
- [0009] FIG. 1B is a top view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0010] FIG. 1C is a bottom view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0011] FIG. 1D is a side view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0012] FIG. 1E is a cross-sectional view of the exemplary mouthpiece and detachable mouth prop of FIG. 1A.
- [0013] FIG. 2A is a perspective view of the exemplary mouthpiece of FIG. 1A where the detachable mouth prop has been detached.
- [0014] FIG. 2B is a top view of the exemplary mouthpiece of FIG. 2A.
- [0015] FIG. 2C is a bottom view of the exemplary mouthpiece of FIG. 2A.
- [0016] FIG. 2D is a side view of the exemplary mouthpiece of FIG. 2A.
- [0017] FIG. 2E is a cross-sectional view of the exemplary mouthpiece of FIG. 2A.
- [0018] FIG. 3A is a front view of an exemplary mouth prop.
- [0019] FIG. 3B is a back view of the exemplary mouth prop of FIG. 3A.
- [0020] FIG. 3C is a bottom view of the exemplary mouth prop of FIG. 3A.
- [0021] FIG. 3D is a perspective view of the exemplary mouth prop of FIG. 3A .
- [0022] FIG. 3E is a side view of the exemplary mouth prop of FIG. 3A.
- [0023] FIG. 3F is a top view of the exemplary mouth prop of FIG. 3A.
- [0024] FIG. 4 is a close-up view of exemplary mesh sides in an exemplary mouthpiece.
- [0025] FIG. 5 is a close-up view of an internal bridge in an exemplary mouthpiece.
- [0026] FIG. 6A is a close-up view of an exemplary reinforcing bar in an exemplary mouthpiece.
- [0027] FIG. 6B is a cross-sectional view of the exemplary reinforcing bar of FIG. 6A.
- [0028] FIG. 7A is a close-up view of an exemplary cheek retractor portion in an exemplary mouthpiece.
- [0029] FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion of FIG. 7A.

DETAILED DESCRIPTION

[0030] Embodiments of the present invention provide for a mouthpiece comprising a main body portion, a cheek retractor portion, and a suction connector portion. In some embodiments, the main body portion, cheek retractor portion, and suction connector portion (and sub-portions thereof) may be molded as one-piece, preferably by injection molding. In an exemplary embodiment, the mouthpiece may be made of a material that is flexible, translucent, conducive to injection molding, high heat-resistant, and autoclavable. Such a material may include silicone. Because the mouthpiece may be made of a high heat-resistant and autoclavable material, such a mouthpiece may be reusable.

[0031] FIGs. 1A-E are different views of an exemplary mouthpiece with an attachable mouth prop 160, while FIGs. 2A-E are different views of the exemplary mouthpiece of FIG. 1A where the attachable mouth prop 160 has been detached. Such a mouthpiece may include a main body portion 110, a suction connector portion 120, and a cheek retractor portion 130.

[0032] The main body portion 110 may include mesh or perforations 140, a stability bar 150, an open slit 170, and an internal bridge 180. The main body portion 110 may connect to a suction connector portion 120 on one end and a cheek retractor portion 130 at the other end. Such a cheek retractor portion 130 may be configured to press against and retract a patient's cheek away from the patient's teeth. When placed in a patient's mouth, the suction connector portion 120 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. The flexibility of the material used to form the mouthpiece allows for some bending when placed in the patient's mouth. The material is, however, resilient enough that the cheek retractor portion presses against the inside of the patient's cheek with such pressure being sufficient to move the cheek away from the patient's teeth.

[0033] An exemplary main body portion 110, when placed in a mouth, 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. The two walls may connect at a superior wall and an inferior wall forming a body that is at least partially enclosed.

Superior may be used herein to refer to the side that rests against a roof of a patient's mouth when placed therein, and inferior may be used to refer to the side that rests against the floor of the patient's mouth. The superior and inferior sides may be formed identically, which may allow for the mouthpiece to change orientation such that the superior side may appear as the inferior side

and vice versa, in the new orientation. When in use, the respective sides of the main body portion 110 may serve to protect and separate the top of the mouth and the bottom of the mouth/tongue. In addition, the main body portion 110 may also serve to protect the back of the mouth (*e.g.*, throat and airway) from falling debris.

[0034] Much of the main body portion 110 of the mouthpiece may be shaped as a straight-line arrowhead or shield whose base generally conforms to the intraoral shape of a patient's mouth. Differently-sized mouthpieces may be provided for differently-sized mouths of adults and children. Part of the base side of the arrowhead may be formed with thicker walls than the rest of the main body. Such thickening may provide additional stability.

[0035] In addition, the main body portion 110 of the mouthpiece may include a plurality of holes 140 distributed along the superior and inferior sides of the anterior and posterior walls to assist in suctioning of water, saliva and debris from the oral cavity. In some embodiments, a set of holes may also form a mesh along the walls of the superior and inferior edges. FIG. 4 is a close-up view of an exemplary mesh wall in an exemplary mouthpiece.

[0036] At the narrow end of the arrowhead that connects to the cheek retractor portion 130, the main body portion 110 may include a rectangular portion. Narrower than the base of the arrowhead, the rectangle may additionally include a reinforcing bar (or stability bar) 150 (described in further detail below) and may be at least partially crossed by a slit 170 (described in further detail below) into the interior of the pocket of the main body portion 110.

[0037] Stability bar 150 may be a protrusion or otherwise a thickened area that reinforces the stability of the rectangular portion and assist in shaping this region to the intraoral posterior shape of a patient's mouth. FIG. 6A is a close-up view of an exemplary stability bar 150 of an exemplary mouthpiece. FIG. 6B is a cross-sectional view of the exemplary reinforcing bar in the cheek retractor connector portion of FIG. 6A.

[0038] In some embodiments, the internal, rectangular-shaped reinforcing or stability bar 150 may be located distally to the internal wavelike bridge structure 180 and attached to both the interior side of the posterior surface of the main body and the rectangular portion. Such a stability bar 150 may be located in the area where a positioned mouthpiece begins to wrap from the lingual side of the most posterior mandibular tooth, around the distal side of the most posterior tooth, and to anterior side of the most posterior mandibular tooth, thereby assisting in shaping the mouthpiece to the general intraoral shape of a patient's mouth.

[0039] Various embodiments of the mouthpiece may further include a longitudinal, open slit 170 extending over approximately two-thirds of the main body on the anterior surface. Running

along the center of the main body across the rectangle and most of the arrowhead, such a slit 170 may assist in capture and suction of water, saliva and debris, as well as assisting in cleaning and maintenance.

[0040] Additionally, the main body of the mouthpiece may include a bridge structure 180 on an interior surface to ensure that the anterior and posterior surfaces remain separated during suction. FIG. 1E is a cross-sectional view of the mouthpiece in which the bridge structure 180 is illustrated. FIG. 5 is a close-up view of the bridge structure 180 without the surrounding walls of the main body portion. Such a bridge structure 180 may be formed as an 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. In some embodiments, the bridge structure 180 may be centrally-located in the main body portion 110 of the mouthpiece. 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. In some embodiments, the bridge structure 180 may follow the shape of a logo (*e.g.*, an arrowhead or shield).

[0041] The suction connector portion 120 may be oval-shaped and also attached to the main body portion 110. The suction connector portion 120 may be formed with thicker walls than the main body portion 110 and 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. The suction connector portion 120 may also include an internal stop to assist in sliding the mouthpiece onto the adapter to a desired depth. The suction connector portion 120 may additionally have an external, concave, notched region 210 that corresponds to a removable strap such that when the strap is in place, the external walls of the strap and the rest of the connector portion may be flush.

[0042] The cheek retractor portion 130 is illustrated as a hammerhead distal region, which may be attached to the main body portion 110. FIG. 7A is a close-up view of an exemplary cheek retractor portion 130 in an exemplary mouthpiece. FIG. 7B is a cross-sectional view of the exemplary cheek retractor portion 130 of FIG. 7A.

[0043] The mouthpiece may be used with a mouth prop 160, as illustrated in FIGs. 1 (with a mouth prop 160) and FIGs. 2 (illustrated without the mouth prop 160). FIGs. 3A-E provide different close-up views of an exemplary mouth prop 160. The removable strap 310 may be attached to portion 320 of mouth prop 160, which may be used to prop open a patient's mouth and teeth. In this regard, the suction connector portion 120 may additionally have an external plug 220 (FIG. 2C) protruding from the posterior side of the suction connector portion 120. Such a

plug 220 may correspond to and serve to connect with an opening in the mouth prop 160. The mouth prop 160 may be reinforced by the presence of the plug 220 in the opening, thereby resulting in a more crush-resistant, nearly incompressible, and stable mouth prop 160. In some embodiments, the suction connector portion 120 may further have a cutout 230 (*e.g.*, which may be shaped as a logo) providing extra interlocking with a corresponding protrusion (*e.g.*, which may also be shaped as a logo) on an external high-suction vacuum adapter.

[0044] The mouth prop 160 may be made of thickened silicone material injection molded in a single piece with an elastic strap corresponding to the circumference of the suction connector portion. The mouth prop 160 has an internal, rectangular-shaped female slot designed to fit snugly with the external, rectangular-shaped male plug 220 of the suction connector portion 120 of the mouthpiece. Mouth props may be made in different sizes for differently sized mouths. Because the mouth prop and mouthpiece are detachable from each other, different sizes of each may be mixed and matched as needed for a particular patient's mouth.

[0045] The mouthpiece as described herein may be used with a one-piece, autoclavable, high-suction vacuum adapter. Such a high-suction vacuum body adapter may be made of a single homogenous material. Having a single lever design, such a vacuum adapter may function in the same manner as all the current high-suction vacuum evacuators and saliva ejectors in controlling the removal of water, saliva, and debris from the oral cavity to the outside vacuum source. The single lever may be designed to control the removal of water, saliva, and debris from the at least partially enclosed so main body through a single, large evacuation conduit within the suction connector portion.

[0046] While various embodiments have been described above, it should be understood that they have been presented by way of example only, and not limitation. The descriptions are not intended to limit the scope of the invention to the particular forms set forth herein. Thus, the breadth and scope of a preferred embodiment should not be limited by any of the above-described exemplary embodiments. It should be understood that the above description is illustrative and not restrictive. To the contrary, the present descriptions are intended to cover such alternatives, modifications, and equivalents as may be included within the spirit and scope of the invention as defined by the appended claims and otherwise appreciated by one of ordinary skill in the art. The scope of the invention should, therefore, be determined not with reference to the above description, but instead should be determined with reference to the appended claims along with their full scope of equivalents.



ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
03/21/2025 07:33:48 PM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
 under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 69691613

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY TAM THANH PHAM

Documents

TOTAL DOCUMENTS: 3

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - IDS Transmittal.pdf	2	Assertion regarding Information Disclosure Statement (IDS) Size Fee (SB/08C)	72 KB
INCEP-001COH - IDS 1449.pdf	1	Information Disclosure Statement (IDS) Form (SB08)	167 KB
Warning: This is not a USPTO supplied IDS fillable form. Data in the form cannot be automatically loaded to other USPTO systems.			
NPL_Nguyen_2024.pdf	8	Non Patent Literature	4835 KB

Digest

DOCUMENT**MESSAGE DIGEST(SHA-512)**

INCEP-001COH - IDS
Transmittal.pdf

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INCEP-001COH - IDS 1449.pdf

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523735B41AA81E7CB2626E8168509

NPL_Nguyen_2024.pdf

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B2E88449E496874353C5653F3FA90

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Under 37 C.F.R. § 1.56 and 1.97-1.98

Examiner:

Pursuant to the provisions of 37 C.F.R. §§ 1.56 and 1.97-98 of the Rules of Practice in Patent Cases, enclosed herewith is form PTO-SB-08, listing several references. The Examiner is requested to make these references of official record in the application.

The references cited may be material to examination of the application and are submitted in compliance with the Applicant's duty of disclosure as defined by 37 C.F.R. § 1.56.

Applicants hereby declare, pursuant to 37 C.F.R. §1.97(e)(2), that no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application and, to the knowledge of the person signing the certification after having made a reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 C.F.R. §1.56(c) more than three months prior to the filing of the information disclosure statement.

For the information disclosure statement (IDS) submitted herewith, the Applicant certifies the following with respect to the cumulative number of applicant-provided provided items of information submitted to date including those in the accompanying IDS (select only one):

- ☒ No IDS size fee is required under 37 CFR 1.17(v) at this time.
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(1).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(2).
- ☐ The IDS is accompanied by the IDS size fee under 37 CFR 1.17(v)(3).

No representation is made or intended as to the completeness of this list, nor is the inclusion of any reference an admission that it is prior art or pertinent to this application.

Respectfully submitted,
POL SINELLI LLP

Dated: March 21, 2025

By: /Tam Thanh Pham/
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Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT <i>(use as many sheets as necessary)</i>				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
Examiner Name	Mirayda Arlene Aponte				
Attorney Docket No.	INCEP-001COH				
Sheet	1	of	1		

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Nguyen, Thien, INTRAORAL DEVICE, Claims received on 12 Feb. 2025, US 20240423768 A1 (Year: 2024)	
		Docket No. INCEP-001COG, U.S. Application No. 18/679,097, Office Action dated 3/11/2025	

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 C.F.R. 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 C.F.R. 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Issue Classification 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

CPC						
Symbol					Type	Version
A61C	/	17	/	0208	F	2013-01-01
A61C	/	17	/	08	I	2019-05-01

CPC Combination Sets						
Symbol				Type	Set	Ranking
	/		/			

/MIRAYDA A APONTE/ Examiner, Art Unit 3772 (Assistant Examiner)	10 March 2025 (Date)	Total Claims Allowed: 28	
/RALPH A LEWIS/ Primary Examiner, Art Unit 3772 (Primary Examiner)	12 March 2025 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1A

Issue Classification 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

INTERNATIONAL CLASSIFICATION			
CLAIMED			
A61C17/08	/	17	/ 08
NON-CLAIMED			
A61C17/02	/	17	/ 02

US ORIGINAL CLASSIFICATION	
CLASS	SUBCLASS

CROSS REFERENCES(S)						
CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)					

/MIRAYDA A APONTE/ Examiner, Art Unit 3772 (Assistant Examiner)	10 March 2025 (Date)	Total Claims Allowed: 28	
/RALPH A LEWIS/ Primary Examiner, Art Unit 3772 (Primary Examiner)	12 March 2025 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1A

Issue Classification 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47															
CLAIMS															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		10		19		28								
	2		11		20										
	3		12		21										
	4		13		22										
	5		14		23										
	6		15		24										
	7		16		25										
	8		17		26										
	9		18		27										

/MIRAYDA A APONTE/ Examiner, Art Unit 3772 (Assistant Examiner)	10 March 2025 (Date)	Total Claims Allowed: 28	
/RALPH A LEWIS/ Primary Examiner, Art Unit 3772 (Primary Examiner)	12 March 2025 (Date)	O.G. Print Claim(s) 1	O.G. Print Figure 1A

Search Notes 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

CPC - Searched*		
Symbol	Date	Examiner
A61C17/08 ,0208,06,00,02,43,046	11/11/2024	MA
Updated search	03/10/2025	MA

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner
433	91-93,140	11/11/2024	MA
	Updated search	03/10/2025	MA

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
PE2Esearch	11/11/2024	MA
Word search, cardboard AND corrugated, cardboard AND corrugated AND box, box AND cardboard WITH corrugated, box AND cardboard WITH corrugated SAME force, box AND cardboard WITH corrugated SAME force SAME compressing, (mouthpiece device) AND (wave ondulat*) AND vacuum	11/11/2024	MA
(Artificial Intelligence) More like doc: US-20200352680-A1, US-20140162209-A1, CA-2851861-A1, JP-S63158813-U	11/11/2024	MA
Overview search done on parent application 14100323	11/11/2024	MA
Word search on (suction vacuum) AND (mouthpiece device), D (mouthpiece device) AND (wave* ondulate*), vacuum SAME tube SAME connector	03/10/2025	MA

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	
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<i>Search Notes</i> 	Application/Control No. 18/823,885	Applicant(s)/Patent Under Reexamination Nguyen et al.
	Examiner MIRAYDA A APONTE	Art Unit 3772

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
A61C17	08,0208,06,00,02,43,046	03/10/2025	MA

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	
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Bibliographic Data

Application No: 18/823,885

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /MIRAYDA A APONTE/

Examiner's Signature

Initials

Title: INTRAORAL DEVICE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
09/04/2024	433	3772	INCEP-001COH
RULE			

APPLICANTS

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CONTINUING DATA

This application is a CON of 18679097 05/30/2024

18679097 is a CON of 18217304 06/30/2023 PAT 12011329

18217304 is a CON of 14228057 03/27/2014 PAT 11744686

14228057 is a CON of 14100323 12/09/2013 PAT 8911232

14100323 has PRO of 61734939 12/07/2012

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

09/12/2024

**** SMALL ENTITY ****

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UNITED STATES

FILING FEE RECEIVED

\$2,720

PATENT
Atty Docket No. INCEP-001COH

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Group Art Unit: 3772

Examiner: Mirayda Arlene Aponte

Serial No.: 18/823,885

Filed: September 4, 2024

In re Application of: Thien Nguyen et al.

Confirmation No.: 8808

Customer No.: 138718

Title: INTRAORAL DEVICE

**List of Co-Pending Patents or Patent Applications That May Be Directed Towards Similar
Subject Matter**

Examiner's Initials	Application No.	Country Code	Docket No.	First- Named Inventor	Title	Filing Date
	18/983,258	US	INCEP-005COB	Thien Nguyen	DENTAL MOUTHPIECE	12/16/2024
	2020274979	AU	INCEP-005AU	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	BR1120210224742	BR	INCEP-005BR	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	202117051466	IN	INCEP-005IN	Thien Nguyen	DENTAL MOUTHPIECE	11/10/2021
	MX/a/2021/013694	MX	INCEP-005MX	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	782154	NZ	INCEP-005NZ	Thien Nguyen	DENTAL MOUTHPIECE	11/9/2021
	29/950,233	US	INCEP-012D	Thien Nguyen	MOUTHPIECE	7/1/2024

PATENT
Atty Docket No. INCEP-001COH

	29/950,231	US	INCEP-013D	Thien Nguyen	MOUTHPIECE MOUTH PROP	7/1/2024
Examiner's Signature:	/MIRAYDA A APONTE/					Date: 02/19/2025

Respectfully submitted,
POLSINELLI LLP

Dated: December 16, 2024

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PE2E SEARCH - Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
L166	4	(((US-20140349249-A1 OR US-20040033468-A1 OR US-20060063129-A1 OR US-20030134253-A1 OR US-20200155284-A1 OR US-20090274991-A1 OR US-20140162209-A1 OR US-20170156832-A1 OR US-20140212841-A1 OR US-20140212838-A1 OR US-20150335409-A1 OR US-20110311942-A1 OR US-20210204923-A1 OR US-20200352680-A1).did. AND PGPB.dbnm.) OR ((US-4167814-A OR US-10390734-B2 OR US-6716029-B2 OR US-6655960-B2 OR US-9827071-B2 OR US-6022214-A OR US-5730599-A OR US-10939979-B2 OR US-9358086-B2 OR US-8029280-B2 OR US-5152686-A OR US-5588836-A OR US-5762496-A OR US-6338627-B1 OR US-D495799-S OR US-4992046-A OR US-D735858-S OR US-8297973-B2 OR US-6974321-B2 OR US-7287981-B2 OR US-6213772-B1 OR US-D962439-S OR US-8545401-B2 OR US-7238023-B1 OR US-3768477-A OR US-4265621-A OR US-4802851-A OR US-11737739-B2).did. AND USPT.dbnm.) OR ((WO-2018126150-A1 OR WO-0042939-A1 OR CN-104490483-A	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/10 02:49 PM

		OR WO-03037205-A2 OR US-20020039715-A1 OR US-20030017433-A1 OR US-20140212841-A1 OR US-20140212840-A1 OR WO-2009134295-A1 OR US-20060063129-A1 OR US-20080008977-A1 OR US-20160270890-A1 OR US-20110112372-A1 OR US-20150335409-A1 OR US-20090246728-A1 OR US-20090298012-A1 OR US-20200352680-A1 OR DE-102009034143-A1).did. AND DWPI.dbnm.) OR ((WO-2018126150-A1 OR FR-2992161-A1 OR WO-0061031-A1 OR CN-104490483-A OR WO-0042939-A1 OR FR-2677538-A1 OR WO-2021231348-A1 OR CN-101068503-A).did. AND FTDB.dbnm.) OR ((JP-2001015053-A).did. AND JPAB.dbnm.)) AND (mouthpiece device) AND (wave ondulat*) AND vacuum					
L168	15338	(A61C17/08 OR A61C17/0208 OR A61C17/06 OR A61C17/00 OR A61C17/02 OR A61C17/43 OR A61C17/046).cpc. OR (433/91-93,140).ccls.	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/10 02:50 PM
L169	5751	L168 AND (suction vacuum)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/10 02:50 PM
L170	4245	L169 AND (mouthpiece device)	(US-PGPUB; USPAT; USOCR; FIT (CN, FR, WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)	OR	ON	ON	2025/03/10 02:51 PM
L171	441	L169 AND (mouthpiece device) AND (wave*	(US-PGPUB; USPAT; USOCR; FIT (CN, FR,	OR	ON	ON	2025/03/10 02:51 PM

		ondulate*)	WO); FPRS; EPO; JPO; DERWENT; IBM_TDB)				
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PE2E SEARCH - Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	British Equivalents	Time Stamp
N5	2219	(A61C17/08 OR A61C17/0208 OR A61C17/06 OR A61C17/00 OR A61C17/02 OR A61C17/43 OR A61C17/046).cpc.	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/10 03:02 PM
N6	112	N5 AND vacuum SAME tube SAME connector	(US-PGPUB; USPAT)	OR	ON	ON	2025/03/10 03:03 PM

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
Examiner Name	Mirayda Arlene Aponte				
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS						
Examiner Initials*	Cite No.¹	Document Number		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code² (If known)				
		US-	12,167,948	12-17-2024	Nguyen et al.	
		US-	2024/0398527	12-05-2024	Nguyen et al.	

FOREIGN PATENT DOCUMENTS							
Examiner Initials*	Cite No.¹	Foreign Patent Document		Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code³ Number⁴ Kind Codes (if known)					

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No.¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T²

/MIRAYDA A APONTE/

02/19/2025

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
Examiner Name	Mirayda Arlene Aponte				
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				
		EP 3965637 B1	12-18-2024	Solmetex, LLC		
		JP 7617081 B2	01-08-2025	Dryshield, LLC		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Australian Application No. 2020274979, Examination Report dated 1/20/25 (INCEP-005AU)	

/MIRAYDA A APONTE/ 03/06/2025

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application No.	18/823,885
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				First Named Inventor	Thien Nguyen
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Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				
		CN 108366851A	08-03-2018	Reyes Hari Mark		
		SG 11202112319Y	10-15-2024	DRYSHIELD, LLC		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Chinese Application No. 202080043728.6, First Office Action dated 10/28/2024 (INCEP-005CN)	

/MIRAYDA A APONTE/ 03/06/2025

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ¹Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

FEE ADDRESS CHANGE

APPLICATION #	FILING OR 371(C) DATE	REQUEST ID
18/823,885	09/04/2024	24611387

The following fields have been changed to Customer Number 138718 on 03/24/2025 via Patent Center in view of the certification copied below that authorized the change.

- Maintenance Fee Address

The address for Customer Number 138718 is:

138718 - Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

I certify, in accordance with 37 CFR 1.4(d)(4), that I am :

An attorney or Agent of Record registered to practice before the Patent and Trademark Office who has been given power of attorney in this application

Signature

Name

Registration #



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

138718 7590 03/24/2025
Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

EXAMINER

APONTE, MIRAYDA ARLENE

ART UNIT

PAPER NUMBER

3772

DATE MAILED: 03/24/2025

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808

TITLE OF INVENTION: INTRAORAL DEVICE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$516	\$0.00	\$0.00	\$516	06/24/2025

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

138718 7590 03/24/2025
Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
TITLE OF INVENTION: INTRAORAL DEVICE				

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	\$516	\$0.00	\$0.00	\$516	06/24/2025

EXAMINER	ART UNIT	CLASS-SUBCLASS
APONTE, MIRAYDA ARLENE	3772	433-092000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,

1 _____

(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2 _____

3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☐ Issue Fee ☐ Publication Fee (if required)

4b. Method of Payment: (Please first reapply any previously paid fee shown above)

☐ Electronic Payment via the USPTO patent electronic filing system ☐ Enclosed check ☐ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
138718	7590	03/24/2025	EXAMINER	
Polsinelli LLP PO Box 140310 Kansas City, MO 64114-0310			APONTE, MIRAYDA ARLENE	
			ART UNIT	PAPER NUMBER
			3772	
DATE MAILED: 03/24/2025				

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).

<https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf>

Routine uses of the information in this record may include disclosure to:

- 1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
- 2) a federal, state, local, or international agency, in response to its request;
- 3) a contractor of the USPTO having need for the information in order to perform a contract;
- 4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
- 5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
- 6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
- 7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
- 8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
- 9) the Office of Personnel Management (OPM) for personnel research purposes; and
- 10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 18/823,885	Applicant(s) Nguyen et al.	
	Examiner MIRAYDA A APONTE	Art Unit 3772	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 21 November 2024.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-28. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____. 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____. 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.	5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____.
---	--

/MIRAYDA A APONTE/ Examiner, Art Unit 3772	/RALPH A LEWIS/ Primary Examiner, Art Unit 3772
---	--

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application is being examined under the pre-AIA first to invent provisions.

Specification

2. The amended specification and abstract were received on 12 February 2025. These amendments are acceptable.

Allowable Subject Matter

3. **Claims 1-28** are allowed.
4. The following is an examiner's statement of reasons for allowance:
 - a. **Regarding claim 1**, the issues indicated in the last Office action of 21 November 2024 have been resolved.
 - b. Therefore, the art of record does not teach or render obvious, either alone or in combination, an isolation mouthpiece for use with a suction in a dental procedure, where the isolation mouthpiece including a plurality of crests of a wave-like structure formed on an interior surface of a second wall to provide contact points with a first wall and a plurality of troughs of the wave-like structure providing gaps between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs in combination with the elements set forth in the claim.
 - c. **Regarding claim 11**, the issues indicated in the last Office action of 21 November 2024 have been resolved.

d. Therefore, the art of record does not teach or render obvious, either alone or in combination, an isolation mouthpiece for use with a suction system in a dental procedure including a plurality of crests of a wave-like structure formed on an interior surface of the second wall to provide contact points with a first wall, and a plurality of troughs of the wave-like structure providing gaps between adjacent ones of the plurality of crests for allowing the suctioning of fluid through the plurality of troughs in combination with the elements set forth in the claim.

e. **Regarding claim 20**, the issues indicated in the last Office action of 21 November 2024 have been resolved.

f. Therefore, the art of record does not teach or render obvious, either alone or in combination, a mouthpiece including a plurality of crests is formed on an interior surface of the second wall to provide a plurality of contact points with the first wall and wherein a plurality of troughs provides a plurality of gaps through which fluids can pass between the contact points in combination with the elements set forth in the claim.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIRAYDA ARLENE APONTE whose telephone number is (571)270-1933. The examiner can normally be reached M-F 8-5.

7. Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at <http://www.uspto.gov/interviewpractice>.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cris Rodriguez can be reached on 571-272-4964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: <https://patentcenter.uspto.gov>. Visit <https://www.uspto.gov/patents/apply/patent-center> for more information about Patent Center and <https://www.uspto.gov/patents/docx> for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MIRAYDA A APONTE/
Examiner, Art Unit 3772

/RALPH A LEWIS/
Primary Examiner, Art Unit 3772



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
03/24/2025 05:28:15 PM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY TAM THANH PHAM

PATENT CENTER # 69702963

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY -

Documents

TOTAL DOCUMENTS: 2

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
web85bfeeaddress.pdf	1	Maintenance Fee Address Change	26 KB
web85b.pdf	3	Issue Fee Payment (PTO-85B)	58 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
web85bfeeaddress.pdf	3C6E17410770469B19072DAC468552AA20D460B9D5460B1CE F2EA0079B7340F26C7B9C15F9870632E6BFF716C1C6601C91 D635FE9A7FCE9EAE00F432410E9520
web85b.pdf	E57A20CF1571E5DFFA7BA3FECA91FF837109117647BF01AAB 2FB725CED09BD9882C5DF56B7A48E20CA842A93E7A0BFDB1

7037B01CC891FA3601669A4D63225AD

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.



UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ISSUE FEE TRANSMITTAL FORM

APPLICATION #	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET #
18823885	09/04/2024	Thien Nguyen	INCEP-001COH

Title of Invention
INTRAORAL DEVICE

Application Information

APPLICATION TYPE	Nonprovisional Application under 35 USC 111(a)	DATE DUE	06/24/2025
CONFIRMATION #	8808	ISSUE FEE DUE	\$ 516
EXAMINER	MIRAYDA APONTE	PUBLICATION DUE	\$ 0
GROUP ART UNIT	3772	TOTAL FEES DUE	\$516
CLASS - SUBCLASS	433/092000	PREV. PAID FEE	\$ 0
ENTITY STATUS	Small		

1. CHANGE OF CORRESPONDENCE ADDRESS AND/OR INDICATION OF FEE ADDRESS (37 CFR 1.33 & 1.363)

Correspondence Address	Maintenance Fee Address
CURRENT ADDRESS	CURRENT ADDRESS



Change of correspondence address requested, system generated AIA/122-PC form attached



Fee address indication requested, system generated SB/47-PC form attached

2. ENTITY STATUS

Change in Entity Status

NEW STATUS

3. THE FOLLOWING FEES ARE SUBMITTED



Issue Fee



Publication Fee

4. FEE AUTHORIZATION



I authorize USPTO to apply my previously paid issue fee to the current fees due



The Director is hereby authorized to apply my previously paid issue fee to the current fee due and to charge deficient fees to Deposit Account Number:



If in addition to the payment of the issue fee amount submitted with this form, there are any discrepancies in any amount(s) due, the Director is authorized to charge any deficiency, or credit any overpayment, to Deposit Account Number:

5. FIRM AND/OR ATTORNEY NAMES TO BE PRINTED

NOTE: If no name is listed, no name will be printed

For printing on the patent front page, list to be displayed as entered

Polsinelli LLP

6. ASSIGNEE NAME(S) AND RESIDENCE DATA TO BE PRINTED

NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application. I also certify that this Fee(s) Transmittal form is being transmitted to the USPTO via Patent Center on the date indicated below.

Signature	Name	Registration #	Date
/Tam Thanh Pham/	TAM THANH PHAM	50565	03/24/2025



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PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

FEE ADDRESS INDICATION FORM

APPLICATION #
18823885

ATTORNEY DOCKET #
INCEP-001COH

FILING DATE
09/04/2024

Title of Invention

INTRAORAL DEVICE

Application Information

ART UNIT 3772

FIRST NAMED INVENTOR

Thien Nguyen

EXAMINER MIRAYDA APONTE

INSTRUCTIONS: In order for the fee address identified on this form to be effective, the issue fee must have been paid for the application listed on this form. Only an address represented by a customer number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. For more information on customer numbers, see the Manual of Patent Examining Procedure (MPEP) § 403

Maintenance Fee Address

Please recognize as the Fee Address under the provisions of 37 CFR 1.363 the address associated with:

138718 - Polsinelli LLP

PO Box 140310

Kansas City, MO 64114-0310
UNITED STATES

Signature

I certify, in accordance with 37 CFR 1.4(d)(4) that I am an attorney or agent registered to practice before the Patent and Trademark Office who has filed and has been granted power of attorney in this application.

Signature

Name

Registration #

Date

/Tam Thanh Pham/

TAM THANH PHAM

50565

03/24/2025



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PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC PAYMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
03/24/2025 05:28:15 PM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY TAM THANH PHAM

PATENT CENTER # 69702963

AUTHORIZED BY -

CUSTOMER # 138718

FILING DATE 09/04/2024

CORRESPONDENCE ADDRESS -

FIRST NAMED INVENTOR Thien Nguyen

Payment Information

PAYMENT METHOD
DA / 501662

PAYMENT TRANSACTION ID
E20253NH28288705

PAYMENT AUTHORIZED BY
TAM THANH PHAM

FEE CODE	DESCRIPTION	ITEM PRICE(\$)	QUANTITY	ITEM TOTAL(\$)
2501	UTILITY ISSUE FEE	516.00	1	516.00
TOTAL AMOUNT:				\$516.00

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ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #
18/823,885

RECEIPT DATE / TIME
03/24/2025 05:37:51 PM Z ET

ATTORNEY DOCKET #
INCEP-001COH

Title of Invention

INTRAORAL DEVICE

Application Information

APPLICATION TYPE Utility - Nonprovisional Application
under 35 USC 111(a)

PATENT # -

CONFIRMATION # 8808

FILED BY Heather Armstrong

PATENT CENTER # 69702946

FILING DATE 09/04/2024

CUSTOMER # 138718

FIRST NAMED
INVENTOR Thien Nguyen

CORRESPONDENCE
ADDRESS -

AUTHORIZED BY TAM THANH PHAM

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
INCEP-001COH - Comments on Reasons for Allowance.pdf	2	Post Allowance Communication - Incoming	127 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
INCEP-001COH - Comments on Reasons for Allowance.pdf	3F727A38BDB3AC787AD725F6567A93A3711254058A7021F7B9 C539A6CC68AE7D8DB41A115621F979CB635BCCE050E4805D D52FE2B4EEE320BA65767EDBDE6AD9

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT(S): SOLMETEX, LLC
APPLICATION NO.: 18/823,885
INVENTOR(S): Thien Nguyen et al.
FILED: September 4, 2024
TITLE: INTRAORAL DEVICE
EXAMINER: Mirayda Arlene Aponte
GROUP ART UNIT: 3772
CONFIRMATION NO.: 8808
ATTY. DKT. NO.: INCEP-001COH

MAIL STOP ISSUE FEE
COMMISSIONER FOR PATENTS
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APPLICANT'S COMMENTS ON REASONS FOR ALLOWANCE

Examiner Aponte,

These comments are responsive to the Notice of Allowance mailed on March 24, 2025, which sets forth the Examiner's statement of reasons for allowance.

The Examiner is thanked for the kind allowance of all pending claims. Applicant acknowledges the Examiner's statement of reasons for allowance as set forth in the Notice of Allowance. However, Applicant points out that the reasons for allowablity of the above referenced claims are not limited to the reasons for allowance as set forth in the Notice of Allowance, and that additional reasons for allowablity may exist, each of which may be independently sufficient to establish the patentability of one or more pending claims.

Applicant respectfully reserves the right to introduce, articulate, or otherwise comment on any such additional reasons for allowance as may be appropriate in any future proceedings concerning the claimed invention.

Respectfully submitted,

March 24, 2025

By: /Tam Thanh Pham/
Tam Thanh Pham (Reg. No. 50,565)
Polsinelli LLP
3 Embarcadero Center, Suite 2400
San Francisco, CA 94111
Office: (415) 248-2100
Fax: (415) 651-9042
patentdocketing@polsinelli.com



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	09/04/2024	Thien Nguyen	INCEP-001COH	8808
138718	7590	04/04/2025	EXAMINER	
Polsinelli LLP			APONTE, MIRAYDA ARLENE	
PO Box 140310			ART UNIT	PAPER NUMBER
Kansas City, MO 64114-0310			3772	
			NOTIFICATION DATE	DELIVERY MODE
			04/04/2025	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocketing@polsinelli.com
sfpatent@polsinelli.com

Corrected Notice of Allowability	Application No. 18/823,885	Applicant(s) Nguyen et al.	
	Examiner MIRAYDA A APONTE	Art Unit 3772	AIA (FITF) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 21 March 2025.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☒ The allowed claim(s) is/are 1-28. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov**.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a) ☐ All b) ☐ Some* c) ☐ None of the:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____ 3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____ 4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____	5. ☐ Examiner's Amendment/Comment 6. ☐ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____
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/MIRAYDA A APONTE/ Examiner, Art Unit 3772	/Cris L. Rodriguez/ Supervisory Patent Examiner, Art Unit 3772
---	---

Substitute for Form 1449/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (use as many sheets as necessary)				Complete if Known	
				Application No.	18/823,885
				Filing Date	September 4, 2024
				First Named Inventor	Thien Nguyen
				Art Unit	3772
				Examiner Name	Mirayda Arlene Aponte
Sheet	1	of	1	Attorney Docket No.	INCEP-001COH

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (If known)			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T6
		Country Code ³ Number ⁴ Kind Codes (if known)				

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
		Nguyen, Thien, INTRAORAL DEVICE, Claims received on 12 Feb. 2025, US 20240423768 A1 (Year: 2024)	
		Docket No. INCEP-001COG, U.S. Application No. 18/679,097, Office Action dated 3/11/2025	

/MIRAYDA A APONTE/
04/01/2025

*Examiner: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

¹Applicant's unique citation designation number (optional). ²Applicant is to place a check mark here if English Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SENT FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.



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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
18/823,885	05/06/2025	12290418	INCEP-001COH	8808

138718 7590 04/16/2025
Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

ISSUE NOTIFICATION

The projected patent number and issue date are specified above. The patent will issue electronically. The electronically issued patent is the official patent grant pursuant to 35 U.S.C. § 153. The patent may be accessed on or after the issue date through Patent Center at <https://patentcenter.uspto.gov/>. The patent will be available in both the public and the private sides of Patent Center. Further assistance in electronically accessing the patent, or about Patent Center, is available by calling the Patent Electronic Business Center at 1-888-217-9197.

The USPTO is implementing electronic patent issuance with a transition period, during which period the USPTO will mail a ceremonial paper copy of the electronic patent grant to the correspondence address of record. Additional copies of the patent (i.e., certified and presentation copies) may be ordered for a fee from the USPTO's Certified Copy Center at <https://certifiedcopycenter.uspto.gov/index.html>. The Certified Copy Center may be reached at (800)972-6382.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Center (<https://patentcenter.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Patents Stakeholder Experience (OPSE), Stakeholder Support Division (SSD) at (571)-272-4200.

INVENTOR(s) (Please see PATENT CENTER site <https://patentcenter.uspto.gov> for additional inventors):

Thien Nguyen, Santa Ana, CA;
Tam Thanh Pham, San Francisco, CA;

APPLICANT(s) (Please see PATENT CENTER site <https://patentcenter.uspto.gov> for additional applicants):

SOLMETEX, LLC, Northborough, MA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit [SelectUSA.gov](https://selectusa.gov).



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patentdocketing@polsinelli.com
sfpatent@polsinelli.com

APPLICATION NO.	ISSUE DATE	PATENT NO.
18/823,885	06-May-2025	12290418

Polsinelli LLP
PO Box 140310
Kansas City, MO 64114-0310

EGRANT NOTIFICATION

Your electronic patent grant (eGrant) is now available, which can be accessed via Patent Center at <https://patentcenter.uspto.gov>

The electronic patent grant is the official patent grant under 35 U.S.C. 153. For more information, please visit <https://www.uspto.gov/electronicgrants>