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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
62/793,198	01/16/2019		280	USCO-105P		

152017
Us Conec Ltd.
1138 25th Street Southeast
Hickory, NC 28602

CONFIRMATION NO. 2564
FILING RECEIPT



Date Mailed: 01/29/2019

Receipt is acknowledged of this provisional patent application. It will not be examined for patentability and will become abandoned not later than twelve months after its filing date. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Jason Higley, Hickory, NC;
Darrell R. Childers, Hickory, NC;
Mitchell Cloud, Matthews, NC;
Jillcha F. Wakjira, Hickory, NC;

Applicant(s)

US Concec, Ltd, Hickory, NC;

Assignment For Published Patent Application

US Conec, Ltd, Hickory, NC
US Conec, Ltd, Hickory, NC

Power of Attorney:

Michael Leetzow--35932

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: 01/28/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/793,198**

Projected Publication Date: None, application is not eligible for pre-grant publication

page 1 of 3

Non-Publication Request: No

Early Publication Request: No

Title

Flexible Push-Pull Boot

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

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4258).

LICENSE FOR FOREIGN FILING UNDER

Title 35, United States Code, Section 184

Title 37, Code of Federal Regulations, 5.11 & 5.15

GRANTED

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

page 2 of 3

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

SelectUSA

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 U.S. offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to promote and facilitate business investment. SelectUSA provides information assistance to the international investor community; serves as an ombudsman for existing and potential investors; advocates on behalf of U.S. cities, states, and regions competing for global investment; and counsels U.S. economic development organizations on investment attraction best practices. To learn more about why the United States is the best country in the world to develop technology, manufacture products, deliver services, and grow your business, visit <http://www.SelectUSA.gov> or call +1-202-482-6800.

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	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		
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	
	Jason		Higley		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Hickory	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	3709 6th St. NE				
Address 2					
City	Hickory	State/Province	NC		
Postal Code	28601	Country	US		

Inventor	2				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Darrell	R.	Childers		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Hickory	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	611 5th Ave NE				
Address 2					
City	Hickory	State/Province	NC		
Postal Code	28601	Country	US		

Inventor	3				Remove
Legal Name					
Prefix	Given Name	Middle Name	Family Name	Suffix	
	Mitchell		Cloud		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

City	Matthews	State/Province	NC	Country of Residence	US
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Mailing Address of Inventor:

Address 1	7138 Forest Ridge Rd				
Address 2					
City	Matthews	State/Province	NC		
Postal Code	28104	Country	US		
Inventor	4				Remove
Legal Name					

Prefix	Given Name	Middle Name	Family Name	Suffix	
	Jilcha	F.	Wakjira		
Residence Information (Select One) ☒ US Residency ☐ Non US Residency ☐ Active US Military Service					
City	Hickory	State/Province	NC	Country of Residence	US

Mailing Address of Inventor:

Address 1	2032 19th Ave Cir NE				
Address 2					
City	Hickory	State/Province	NC		
Postal Code	28601	Country	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button.					

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
☐ An Address is being provided for the correspondence information of this application.			
Customer Number	152017		
Email Address	michael@leetzow.com	Add Email	Remove Email
Email Address	ssengupta@usconec.com	Add Email	Remove Email

Application Information:

Title of the Invention	Flexible Push-Pull Boot		
Attorney Docket Number	USCO-105P	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	26	Suggested Figure for Publication (if any)	

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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	152017		

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		Remove	
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button.			

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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)

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

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	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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	Joint Inventor
Person to whom the inventor is obligated to assign.		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	US Conec, Ltd	
Mailing Address Information For Applicant:		
Address 1	1138 25th Street SE	
Address 2		
City	Hickory	State/Province
Country	US	Postal Code
Phone Number		Fax Number
Email Address	ssengupta@usconec.com	
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	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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:

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	/Michael L. Leetzow/		Date (YYYY-MM-DD)	2019-01-16
First Name	Michael	Last Name	Leetzow	Registration Number
Additional Signature may be generated within this form by selecting the Add button.				Add

Application Data Sheet 37 CFR 1.76		Attorney Docket Number	USCO-105P
		Application Number	
Title of Invention	Flexible Push-Pull Boot		

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.

ROI# 129
Atty. Dkt. No.:

1. Name(s) of Inventor(s):

- 1.1. Jason Higley
- 1.2. Darrell Childers
- 1.3. Mitchell Cloud
- 1.4. Jillcha Wakjira

2. Short Title of Invention: Flexible Push-Pull Boot

3. Circumstances Leading to the Invention:

High Density fiber-optic connector applications call for a need to insert and remove connectors easily without worrying about snagging or difficulty in handling the connector, especially when surrounded by many other connectors. Connectors should be able to handle push-pull forces without damage to any part of the connector or surrounding components. A user gripping any part of the connector may carry out pushing the connector, but pulling should preferably be carried out using a boot or a pull-tab.

3.1 Current State of the Art (optional – include any patents/publications/articles with a date on them):

Current connectors either require a user to have a proper grip and apply a force to pull a connector out or push it into an adapter or a port. Alternatively or additionally, a separate push-pull tab component to insert or remove the connector may be used.

3.2 Describe at least one drawback/problem with the current state of the art:

Current fiber-optic connector boots have limited stiffness to handle push-pull forces. In a high-density environment, a push-pull tab on the connector takes up space from the small footprint requirements of the connectors. Further, the push-pull tab handle may snag on fiber cables nearby, thereby damaging the connector, the cable, and/or the connector port.

4. Detailed Description of Invention:

Various aspects of this disclosure provide a number of designs for fiber-optic connector boots that address the issues with the current state of the art. The boots described herein have greater flexibility and transmit the force required to effectuate insertion or disengagement from a port or

an adapter along a continuous path (e.g., allowing pulling along an axis of the boot/connector). That is, along the body of the boot, no impulsive forces are generated during pushing or pulling of the boot as there is no discontinuity in the transmission of the force from one end thereof to the other. As a result, the boot implementations described herein handle push-pull forces better than the conventional boots, by providing stiffness along the longitudinal direction without collapsing on the fiber cable and by simultaneously being flexible in the perpendicular direction.

According to a first design, a flexible push-pull boot is illustrated in FIGS. 1-3. FIG. 1 illustrates a perspective view of this boot having interlocking hooks. The interlocking hooks are disposed on the top and bottom sides of a tubular boot body. The interlocking hooks are generally shaped as the letter “S”, as visible in FIGS. 1-3, with the exception of a rear terminal hook and a front terminal hook (see, e.g., FIG. 2, top view). The rear and front terminal hooks are generally semi-circular or “C” shaped. The interlocking between the hooks occurs with the spatial overlap of the ends of the S or C shaped hooks, for example, two ends of the successive hooks overlap along the direction of the longitudinal axis, as illustrated in FIGS. 1-3. The front end of the boot attaches to a body of the fiber optic connector (not shown). A pair of front latches aid in such attachment, and attach to the back end of the connector. The tubular boot body defines a longitudinal opening into which a fiber-optic cable goes into.

More specifically, as illustrated in FIG. 2, top view of the flexible boot, the interlocking hooks include the rear terminal hook, followed by successive intermediary hooks, and the front terminal hook, moving from the rear side of the boot towards the front side of the boot. The rear terminal hook extends from the grip part of the boot, and the front terminal hook extends from the top side of the boot toward the intermediary hooks. It will be appreciated by one of ordinary skill in the art that the number and the specific orientation of the interlocking hooks, as well as the dimensions may be varied to adjust a degree of interlocking between the hooks. For example, the interlocking hooks may have a longer end-to-end length and may be smaller in number. Further, instead of the S-shaped hooks, C-shaped hooks may be used (e.g., as shown in the alternative shapes for the intermediary hooks in FIG. 2).

In the side view of the flexible boot shown in FIG. 2, the rib structure of the boot is formed as extending from the grip portion of the boot and curling around the longitudinal axis while maintaining a substantially uniform opening inside the boot to accommodate a fiber-optic

cable. Each portion of the curled structure may be referred to as a rib, and makes an angle α relative to the longitudinal axis. The angle α may be 45° , although other angles in the range of 20° - 70° may be implemented thereby varying the number of ribs or density of the ribs along the boot body. The value of the angle α is one of the factors determining the flexibility of the boot. For example, a smaller angle may make the boot more flexible (less rigid) and vice versa for a larger angle in the aforementioned range.

The separation between the ribs allows the boot to compress or extend in length along the longitudinal axis, as well as allows for angular flexure about the longitudinal axis. A user may hold the grip to pull or push the boot. As illustrated in FIG. 3a, when a pull force is applied to the boot, for example, at the grip or elsewhere, spacing between the ribs increases. Simultaneously, the spacing between the terminal ends of the interlocking hooks decreases as compared to a relaxed state of the boot (FIG. 3b). For example, depending upon the magnitude of the pull force, the terminal ends of the interlocking hooks may touch or abut acting as stop surfaces for each other. Such contact adds to the resilience and stiffness of the boot to the pulling force. Likewise, when a push force is applied to the boot to insert the connector attached thereto into an adapter or a panel port, the spacing between the ribs collapses all the way up to a point when the ribs touch each other. Again, simultaneously, under a push force, the spacing between the terminal ends of the interlocking hooks will increase, as illustrated in the compressed state of the boot in FIG. 3c. Depending upon the dimensions of the boot, the spacing may increase to have the end portions of the hooks touch the middle portions of the S-shaped hooks. Likewise, in the case of the C-shaped interlocking hooks (as shown in the alternative in bottom most part of FIG. 2), the ends may translate as indicated by the bi-directional arrows.

Accordingly, the aforementioned boot design implements a continuous force transmission along the body of the boot using hooks and rib structure, while maintaining flexibility in other directions.

5. Permissible Variations in the Invention – think about how someone could design around:

Variations of the aforementioned push-pull boot structure are contemplated to be within the scope of this disclosure and are presented herein below. It will be appreciated by one of ordinary skill in the art that the features of the boot presented in different versions and variations may be

combined or eliminated as the technical application may require. For example, one or more of the stiffness features and flexure features from one version may be replaced with such features from another version of the boot design presented herein.

5.1 In accordance with one variation, the interlocking hooks are distributed on top, bottom, and both sides of the generally tubular body of the boot. In this version of the boot, the interlocking hooks are all “C” shaped, as opposed to the “S” shaped structure of the first version of the boot presented above. The interlocking hooks in each pair face in opposite directions such that one end of each hook in the pair falls inside the circumference of the other, as illustrated in FIGS. 4-6. That is, the interlocking occurs with the spatial overlap of the ends of the C shaped hooks, for example, two ends of the successive hooks overlap along the direction of the longitudinal axis.

The shape and arrangement of the rear terminal hooks and the front terminal hooks remain the same as the first version of the boot presented above. Likewise, the shape and structure of the continuous rib structure is the same as the first version. An advantage of this second version of the boot compared to the first version is that the second version has more angular flexibility due to the distribution of the hooks all around the body of the boot, as opposed to only on the top and bottom side of the boot body, as presented in the first version.

FIG. 5 illustrates the top and side view of the second version of the flexible view. Again, the interlocking pairs of hooks are present on all sides of the boot body. In the example illustrated, the hook pairs are distributed sequentially with one pair at the top to another pair on the first side to another pair on the bottom, then to another pair on the second side of the boot, and so on. However, such a distribution is one example and other variations to such a distribution are contemplated in view of this description. For example, another distribution of hooks that may have similar force transmission effects could include two consecutive pairs of hooks on the top followed by two consecutive pairs on the side, two on the bottom, and two on the other side, and so on.

FIG. 6a illustrates an extended state of the second version of the boot in which a user pulls the boot to disengage the fiber optic connector from an adapter, for example. Again, similar to the first version, when pulled, the spacing between the ribs increases and the interlocking ends of

the hooks in each hook pair move closer or make contact. The opposite happens when a push force is applied to the boot (FIG. 6c). In this case, the rib structure contracts and the spacing between the ribs reduces up to when the individual ribs make contact. Again, the spacing between the interlocking ends of the individual hooks in each pair increases, as illustrated in FIG. 6c. FIG. 6b illustrates the relaxed state of the boot as a reference.

5.2 According to a third version of the flexible boot illustrated in FIGS. 7-9, the boot comprises interlocking C-shaped hinges. The C-shaped hinges are constructed as a single integral piece, and therefore this boot is not an assembled boot. The series of hinge-joints may, for discussion purposes, be classified into forward facing and rearward facing hinge joints. Referring to FIG. 8, a flat version of the tubular body of the boot is illustrated to better show how the individual C-shaped hinges are connected. That is, in FIG. 8, the top part of the figure wraps around to join the bottom part of the figure, or vice-versa to form the tubular boot body.

The basic structure of each hinge joint (whether forward facing or rearward facing) is in the shape of a tilted C. The term “forward facing” refers to the C-shape generally facing in the same direction as the longitudinal axis of the boot toward the connector body (not shown) away from the grip of the boot, and likewise “rearward facing” refers to the C-shape facing away from the connector body against the direction of the longitudinal axis towards the grip of the boot. The term “tilted” refers to an angle θ that a line of symmetry drawn through the center of the C-shape makes with the longitudinal axis, as illustrated in FIG. 8.

Continuing with the construction of the C-shaped hinge joint, the C-shape has a top extension, a bottom extension and a middle extension, all going in a direction away from the C-shape. The middle extension forms a hinge to go into another C-shaped hinge, as illustrated. The top extension of a forward facing C-shaped hinge joins to a bottom extension of a rearward facing C-shape, or vice-versa.

With respect to the integral structure of the boot, the chained arrow at the front end illustrates how the lower part of the figure attaches to the top part. Likewise, near the grip, another chained arrow illustrates how the top extension of the first rearward facing C-shaped hinge attaches to the grip at the lower part of the figure.

FIG. 9 illustrates a top view of the flexible boot, the bottom view will be similar. The side view best illustrates how the boot flexes in both upward and downward directions (only one direction illustrated in FIG. 9). In either direction, the middle extension on each C-shaped hinge rotates in the empty space between the top and the bottom extension of the C-shaped hinge immediately preceding that C-shaped hinge. The section view of the boot in FIG. 9 illustrates the forward facing C-shaped hinges. The interlocking between individual C-shaped hooks occurs with the middle extension from each C-shaped hook interlocking within the arcuate part of the C-shape.

5.3 In a fourth version of the boot illustrated in FIGS. 10, a single opening is created on an otherwise solid bodied boot. The single opening is continuous extending from the grip of the boot to the front end of the boot as illustrated, for example, in the side view of the boot in FIG. 11. As best illustrated in FIG. 11, the opening starts or ends at both ends of the boot. The opening creates a circuitous pattern may resemble shapes of a puzzle fitting together. However, the boot body is integrally molded and is not assembled from different puzzle pieces. The single opening creates interlocking members that provide strength in the longitudinal direction to the boot, while at the same time providing flexibility in the perpendicular direction. FIG. 11 also illustrates a cross-section profile view of the circuitous pattern formed by the opening.

5.4 According to a fifth version of the boot illustrated in FIGS. 12-14, the boot is made of half U-shaped joints. In this version, the boot is an assembled boot where each U-joint is attached to the next one to form the body of the boot. FIG. 14 illustrates how the U-joints attach to each other to form the boot. Each U-joint includes an opening along the longitudinal axis through which one or more fiber optic cables can pass. Each U-joint includes two U-lip members (“U-lips”) extending away from the body of the U-joint toward a front-end direction of the boot. Between the two U-lip members, two flanges surround the body of the U-joint. On the same side as each of the flanges, but disposed nearer to the rear end of the U-joint, is a projection. Each of the two projections fits into a respective hole on the U-lip of the next U-joint, as illustrated in FIGS. 12 and 13, to form the boot. The fitting of the projections into the lip holes is illustrated by chained arrows in FIG. 14 that illustrates three views of the U-joints. A

front curved portion of the U-lip abuts against a rearward facing surface of the flange, which surface acts as a stop surface for the U-joint.

5.5 According to a sixth version of the push-pull boot illustrated in FIG. 15, the boot includes a spine member and a series of fork-handle members connected to the spine member. The fork-handle is formed from two curved parts joined at both ends to a respective single curved part. The single curved parts then join to the spine member. Each fork member is connected to the next fork member by a fork bridge, as best illustrated in the side and bottom views of the boot in FIG. 16. In the top view of the boot in FIG. 16, the fork bridge is hidden. The fork-handle structure and the spine are integrally molded as a single piece extending from the grip of the boot to the front end of the boot. When the boot experiences compressive/pushing forces, the individual forks come closer. Likewise, during extension/pulling forces, the boot stretches longitudinally such that the individual forks move away from each other. The presence of the spine member adds strength to the boot in the longitudinal direction. The spine may taper in thickness from the front end of the boot toward the rear end near the grip. This adds to the flexibility of the spine.

5.5.1 In a variation of the sixth version, the spine may include a metallic member that is longitudinally placed inside the spine. Alternatively, the metallic member may be a strip outside the spine that can be freely hooked on to the boot body. The metallic member is dimensioned to stay within its elastic limits so it can revert back to its relaxed state when the boot is not being bent or flexed. Yet another variation of this flexible boot may not have the forked rib structure, and may instead include only the spine and the grip (see, FIG. 15a). The length of the grip along the longitudinal axis may then be lesser than that shown.

5.5.2 In a further variation of the sixth version, instead of the handle and fork structure, the spine may support a spiral member, as illustrated in FIG. 16a. The spiral member may be in the shape of a tapered helix from the grip toward the front portion of the boot. Alternatively, spiral shapes other than a helix may be used. Still alternatively, more than one spiral or helix members may be present. For example, two spiral members running in opposite directions from the grip

toward the front portion may be used. The term “opposite” as used in this variation refers to how the respective radial vector for each spiral would rotate about the longitudinal axis to generate the respective spiral.

The spiral structure extending from the grip toward the front end of the boot may be interrupted by optional grips between the grip and the front end of the body. These optional grips may be used to control the strength of the boot based on various applications and force requirements. Furthermore, the individual ribs may not spiral around the spine, and instead may be circular members hanging off the spine with the fiber cable passing through them. That is, the ends of each rib may join the spine at more or less the same spot, in which case they would not appear to spiral in the views shown in FIGS. 16a-16c.

FIG. 16b illustrates a side view of the boot with the spiral member and the spine, and FIG. 16c illustrates the bottom view of the boot.

5.6 According to a seventh version of the flexible push-pull boot shown in FIG. 17, the boot has accordion-like members that compress or expand the length of the boot. When pulled, the accordion members stretch out to increase the length of the boot. Likewise, when pushed, the accordion members contract to reduce the length of the boot. Accordingly, the boot is designed to handle longitudinal forces along its body, and also has some angular flexibility. The flexibility of this version of the boot is analogous to a flexible straw.

5.7 According to an eighth version of the flexible push-pull boot, a boot formed by ball and socket joints is illustrated in FIG. 18. This boot is also an assembled boot with each ball and socket joint fitting into the next ball and socket joint to form the body of the boot. FIG. 19 illustrates a top view, a side view and a cross-section view of the ball and socket joint boot. In the cross-section view in FIG. 19, the interlocking of the ball and socket joints is more clearly illustrated. As illustrated in FIG. 20, each individual ball and socket member includes two curved structures, each of different surface area. Each of the curved structures have a larger radius and a smaller radius and are joined together so that the smaller radii coincide, as illustrated in FIG. 20 ($R_1 > R_2 > R_3$, R_i being a radius of the curved structure).

5.8 According to a ninth version of the flexible push-pull boot shown in FIG. 21, the boot may have a flexible tapered body in the shape of a frustum of a cone. This body is molded around a spiral spring, such that the boot material surrounds the spring. This spring provides stiffness needed during pushing and pulling of the boot, in addition to flexibility in various directions.

5.9 According to a variation of the flexible push-pull boot shown in FIG. 22, the boot body is same as that in the ninth variation (FIG. 21). However, instead of a spiral spring, the boot body is molded around linear wires or rods. The wires add stiffness in the direction of the longitudinal axis, but also provides flexibility.

5.10 According to a tenth version of the flexible push-pull boot shown in FIG. 23, a body of the boot is riddled with through holes, or is perforated. These through holes may be randomly positioned along the body or may be in a specific pattern. For example, the through holes may lie along an imaginary spiral curve running along an outer surface of the body. The holes may be spaced at equal distances along that imaginary spiral curve.

However, it will be appreciated in view of this disclosure that the holes cannot be in a straight line as that would weaken the boot to a point where it starts acting like a conventional serrated boot. The conventional serrated boot does not have enough stiffness for push. One has to thicken the boot to get push performance out of it. However, by thickening the serrated boot, bend performance or flexibility is compromised.

On the other hand, the perforated boot will have the flexibility of a serrated boot, but with increased stiffness to provide the push performance needed.

6. Advantages of the Invention Over the Prior Practice:

The boot designs described herein provide stiffness in the longitudinal direction but flexibility in the perpendicular direction. This is advantageous in high-density connector applications where, using the boot implementations described herein, connectors can be easily pushed in or pulled out from a highly populated group of connectors, while at the same time, any be bent in a different direction to aid the push-pull action on a connector.

Various boot design concepts disclosed herein allow the boot to be sufficiently stiff while pushing so that when a user pushes with the insertion force required for the connector, the boot does not buckle. That is, during insertion of the connector, when the user pushes the boot inside, the boot may bend at an angle (0° to 10° relative to the longitudinal axis), but still continue to transfer insertion force along the longitudinal axis, without buckling or collapsing on itself. Therefore, the user can push the boot without perfect alignment, and the boot is able to accommodate a slight angle, approximately less than 10° , and some offset on the back of the boot, approximately less than 10 mm, without buckling.

7. US Conec Product(s) to which this disclosure may apply:

Smaller footprint duplex type connectors having two or more ferrules would be one example. Other connectors where a continuous force transmission along the body of the boot is desired may use these boot designs too, e.g., in high-density connector applications where several MPO style connectors are placed close to each other in a tight space.

8. Conception Date: (Give day, month and year; and specify records relied on.) Early May 2018.

7.1 Were there any non-US Conec parties involved in the conception? No

9. Earliest Disclosure to Others outside US Conec: (State where, what, when and to whom; specify records relied on.) None

10. Date of Earliest Sketch or Drawing: (Give Drawing Serial Number) May 18, 2018

11. Representative Claim(s):

11.1 A boot for a fiber-optic connector, comprising:

a primary tubular member with openings;

a plurality of interlocking hooks on an outer surface of the primary tubular member, wherein the interlocking members translate between two positions upon compression or extension of the primary tubular member.

11.2 A boot for a fiber-optic connector, comprising:

a main body having a front end and a back end;

a spine member between the front end and the back end;

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a plurality of flexible forked members having a handle on each side of the spine and two forks around the spine joining the two handles on each side, the two forks further connected adjacent forks of other flexible forked members or to a grip or a front end of the boot.

11.2 A flexible push-pull boot for a connector, comprising:

a main body extending along a longitudinal axis in a direction of insertion of the connector;

a plurality of flexible members configured to move from a first position to a second position upon application of an insertion force longitudinally.



First Version – Interlocking Hook Design

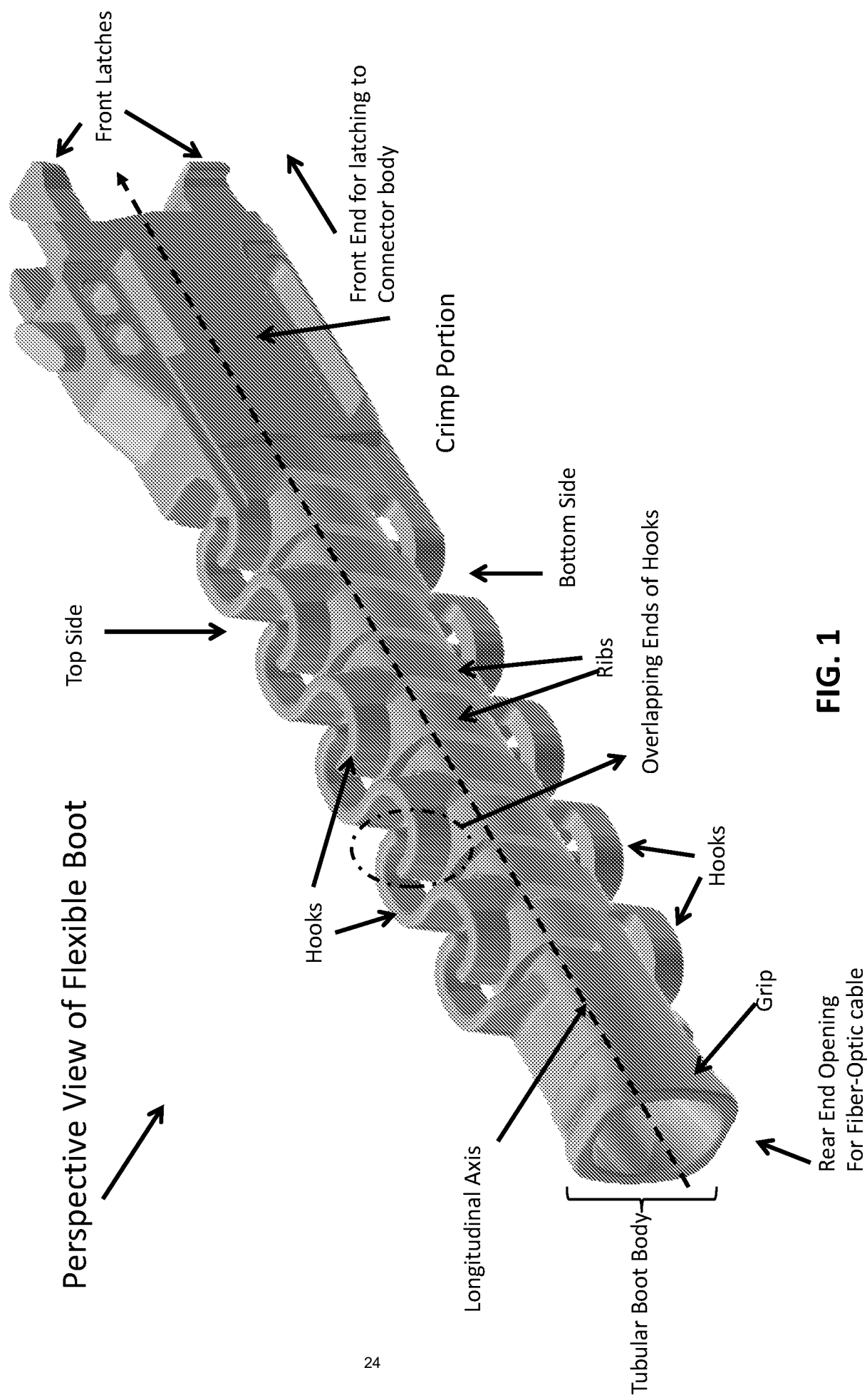
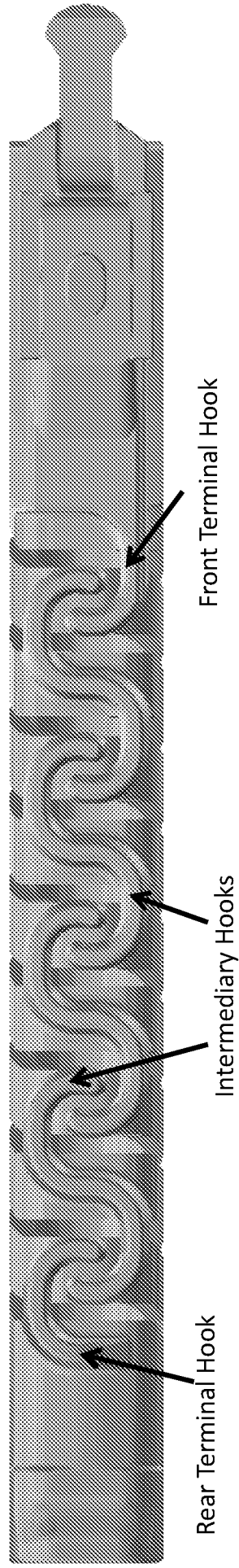
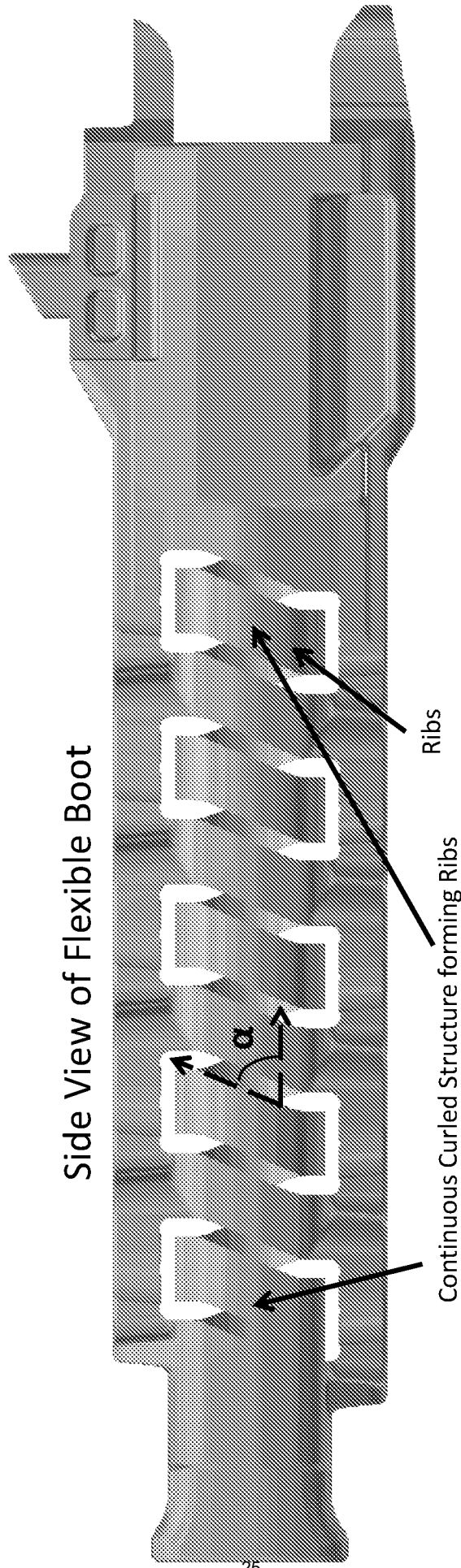


FIG. 1

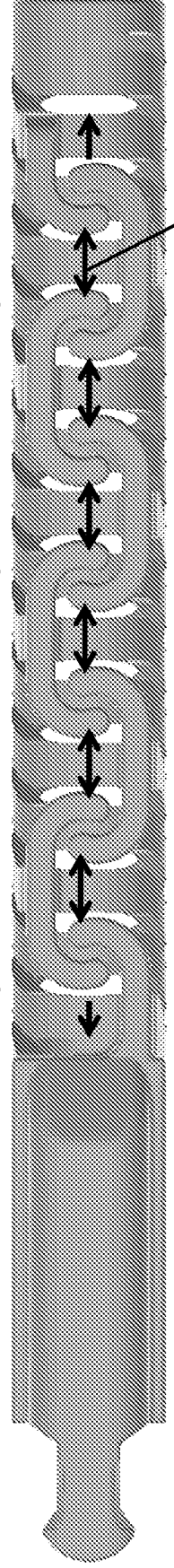
Top View of Flexible Boot



Side View of Flexible Boot

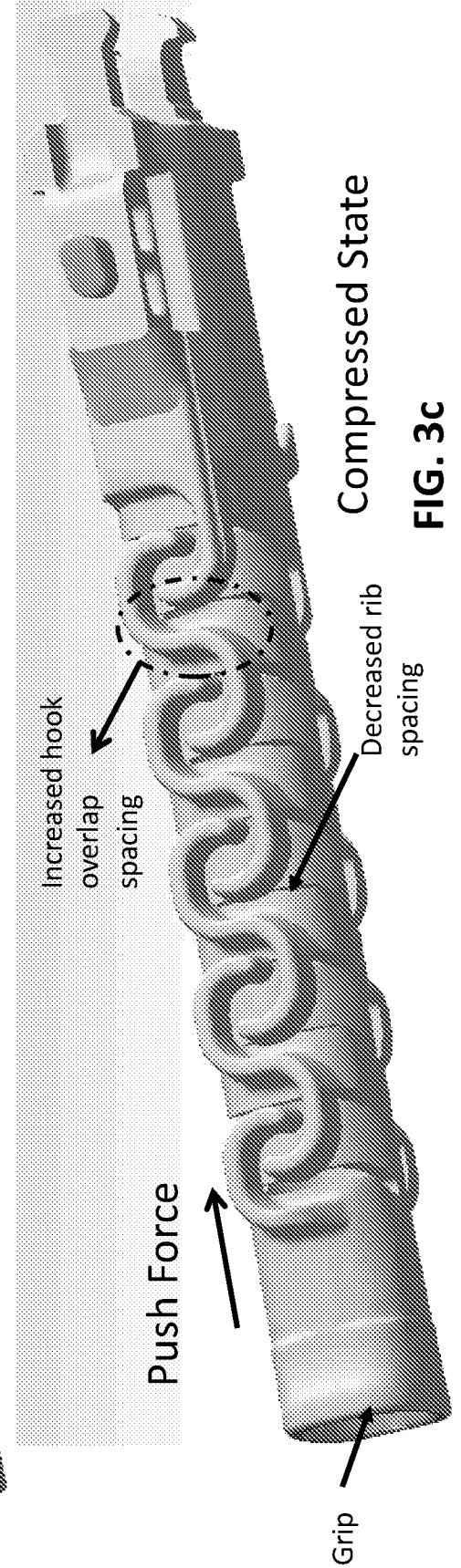
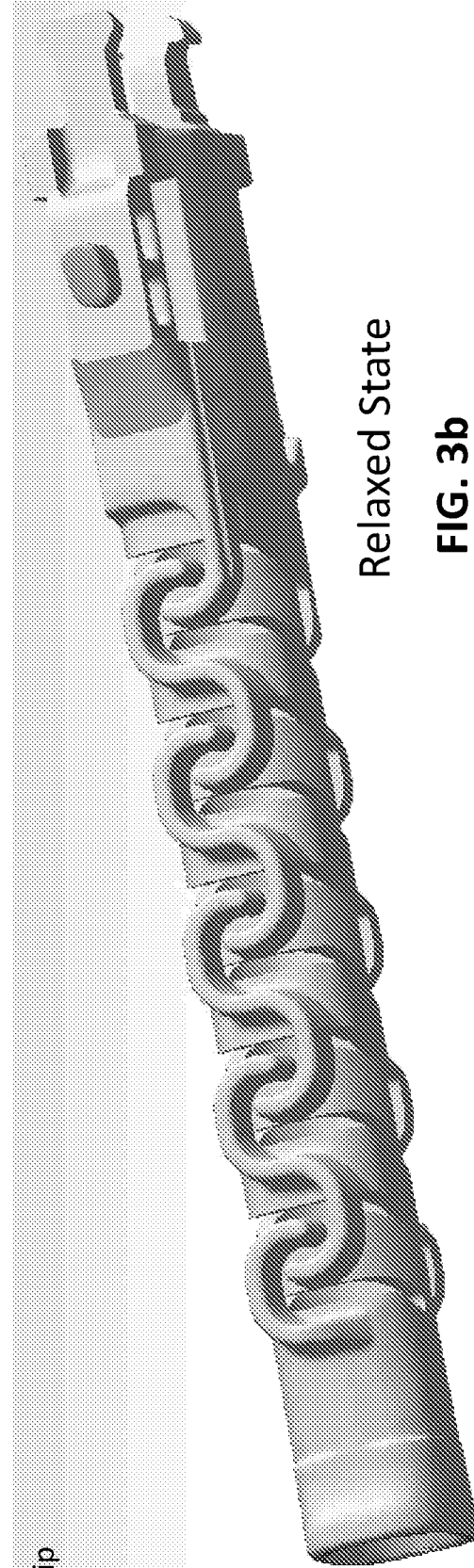
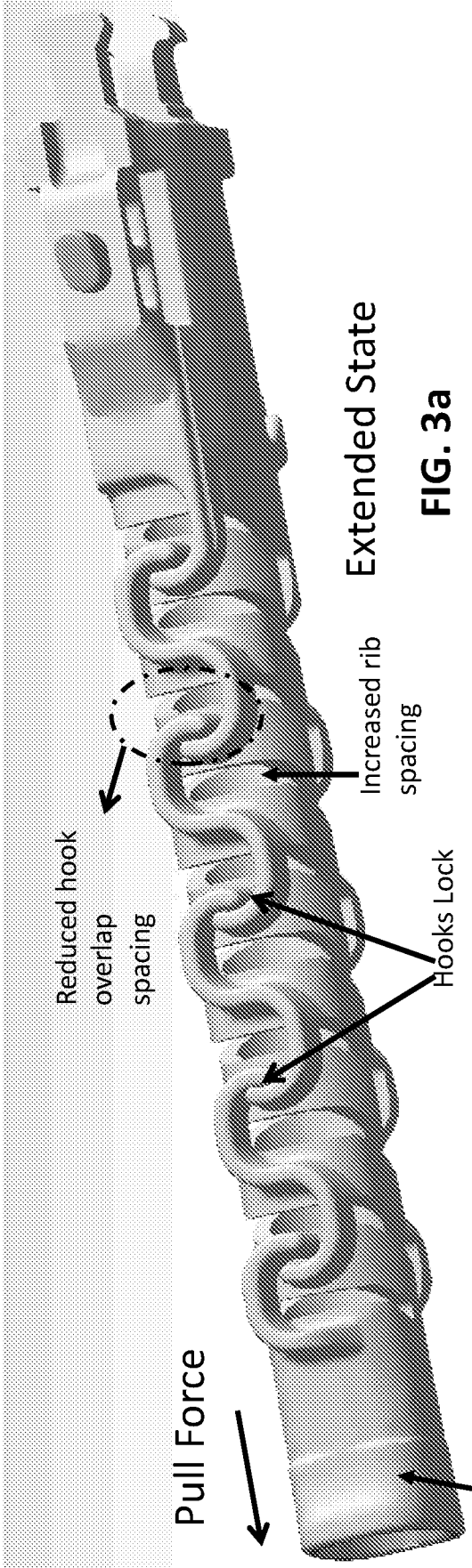


Alternative shape for the intermediary hooks (C-shape)



Arrows indicating direction of translation/movement of the hooks

FIG. 2



Second Version- Alternate interlocking hook arrangement

Perspective View of Flexible Boot

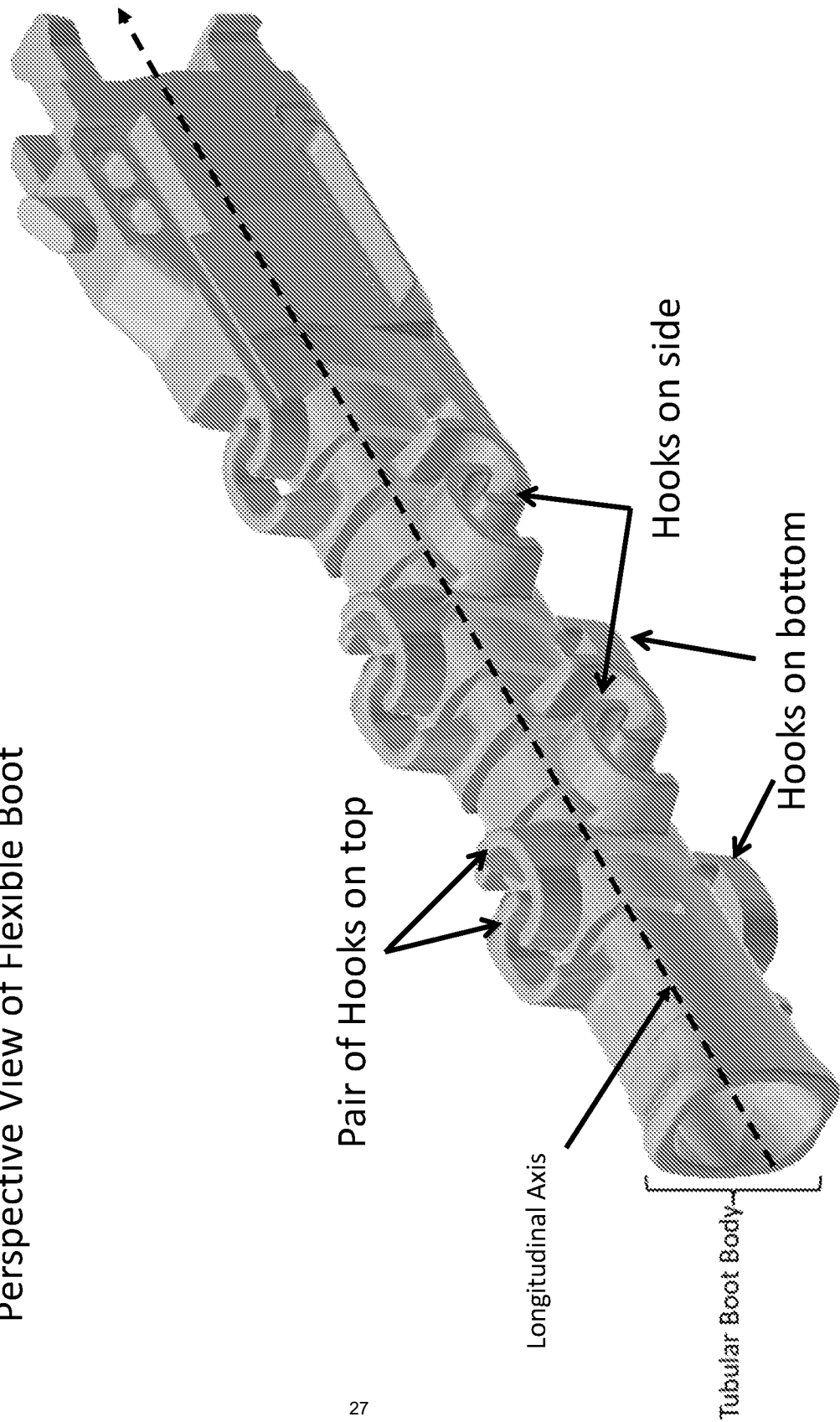
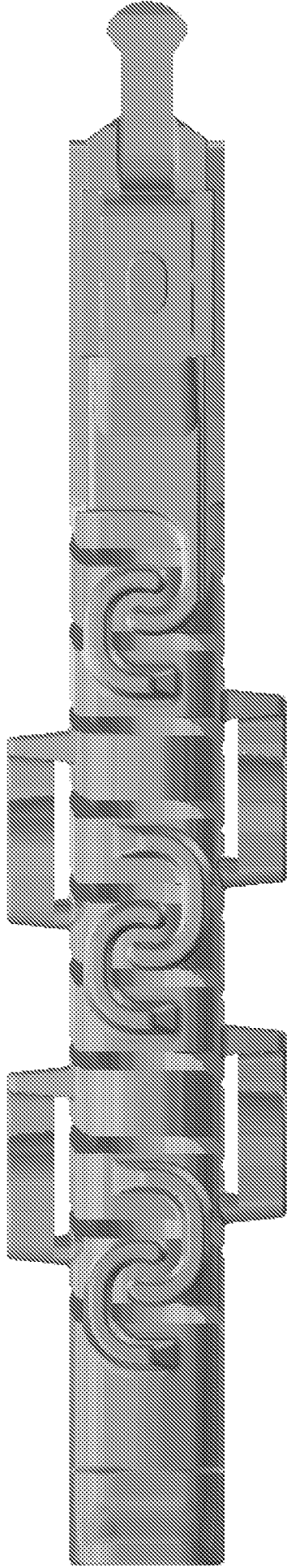


FIG. 4

Top View of Flexible Boot



Side View of Flexible Boot

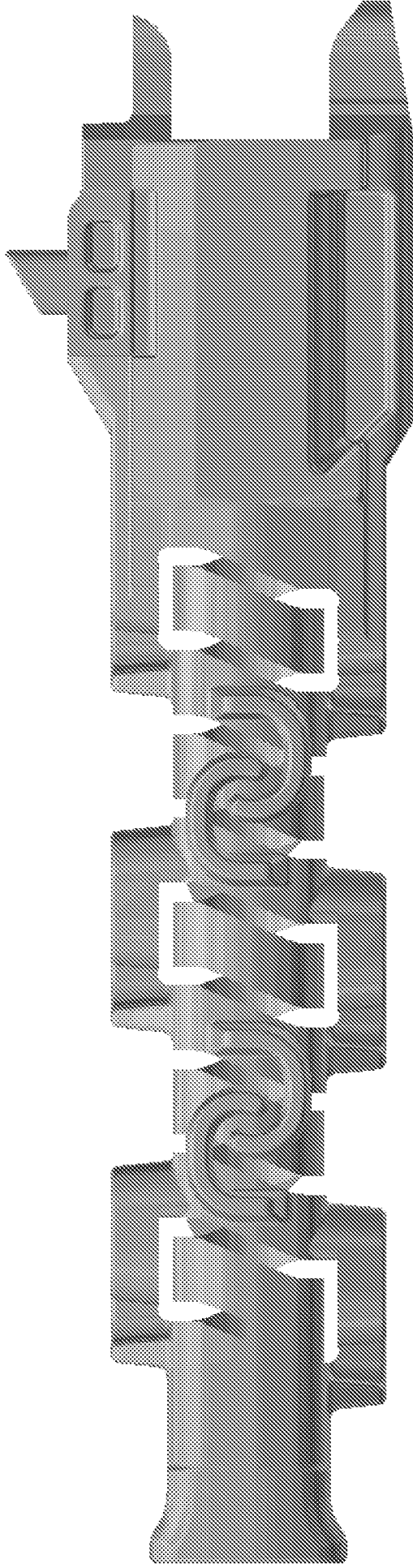
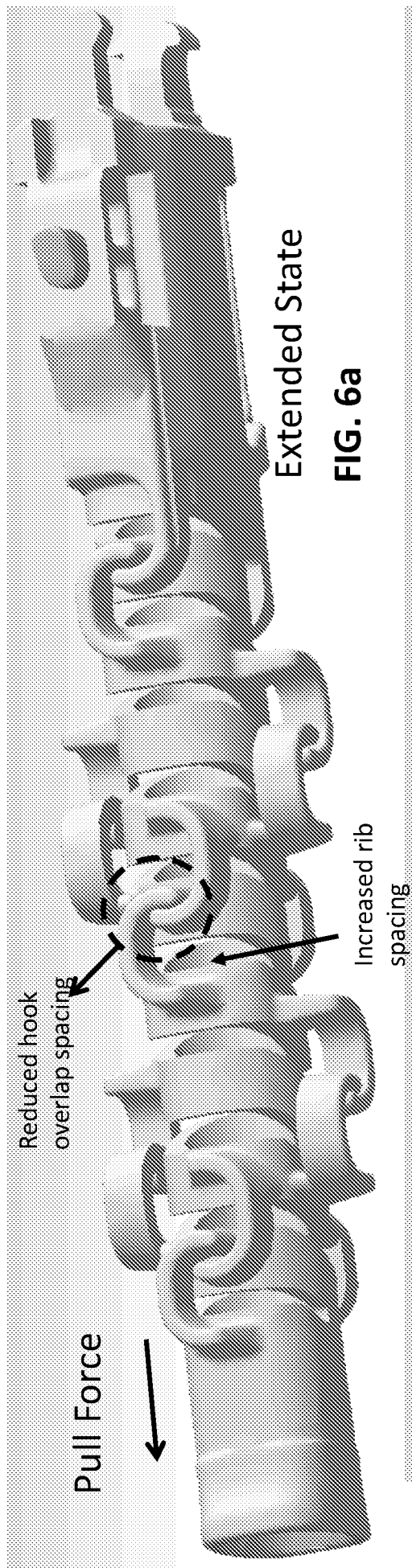
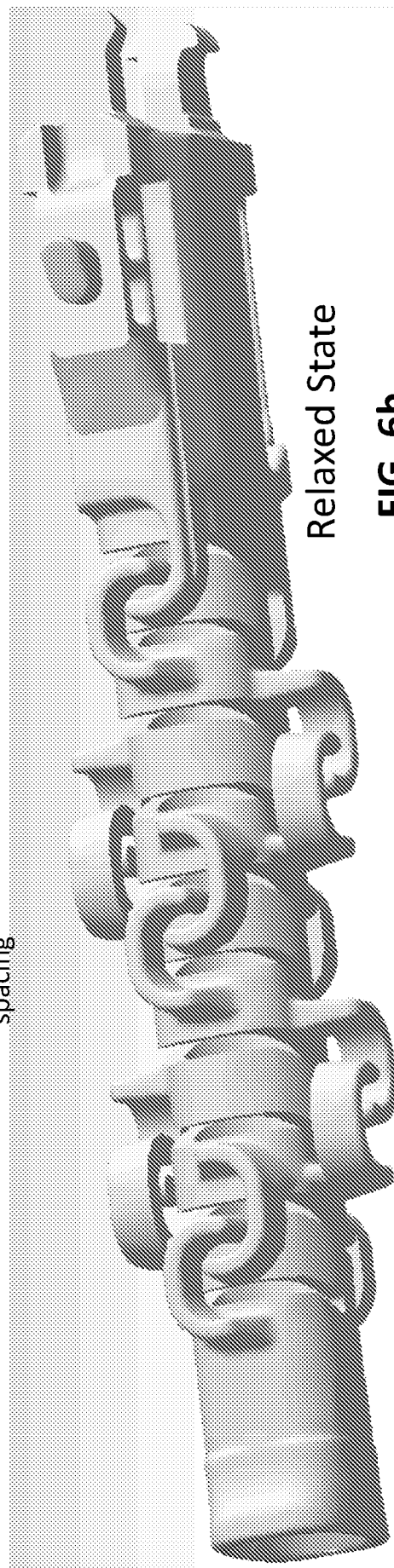


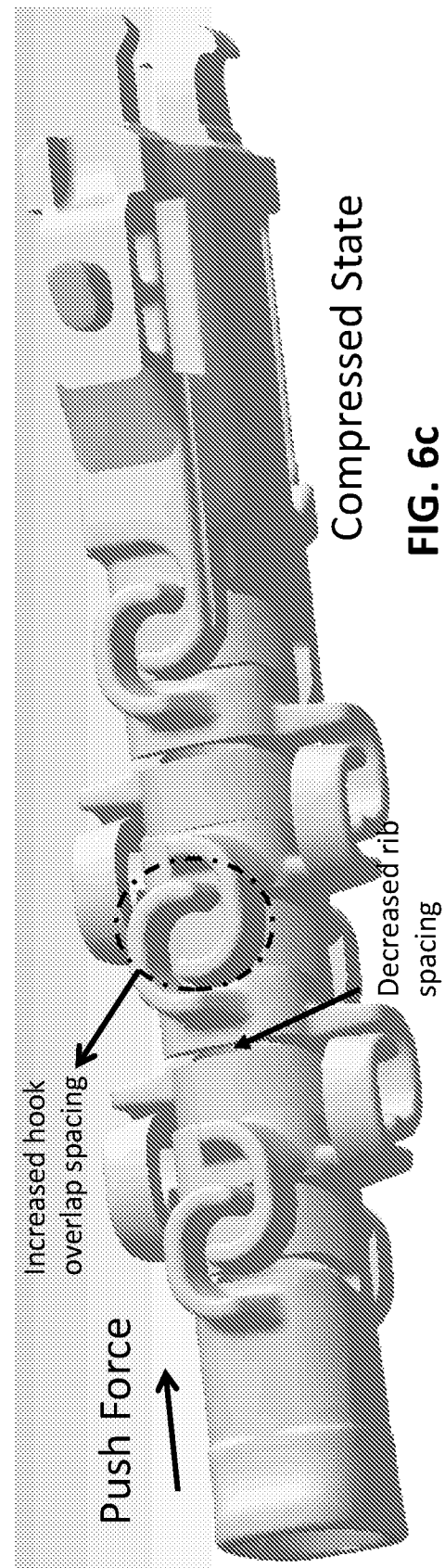
FIG. 5



Extended State
FIG. 6a



Relaxed State
FIG. 6b



Compressed State
FIG. 6c

Side Locking Push Pull Boot

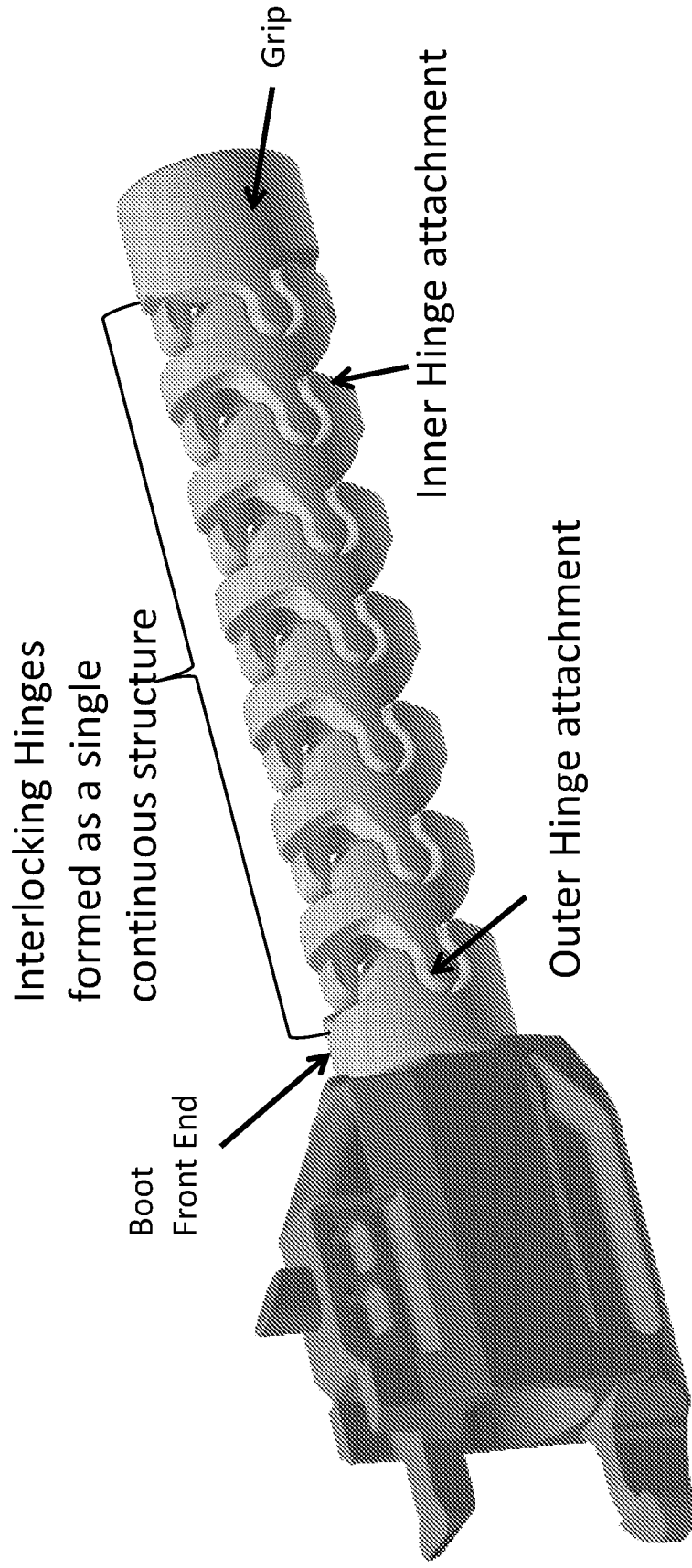
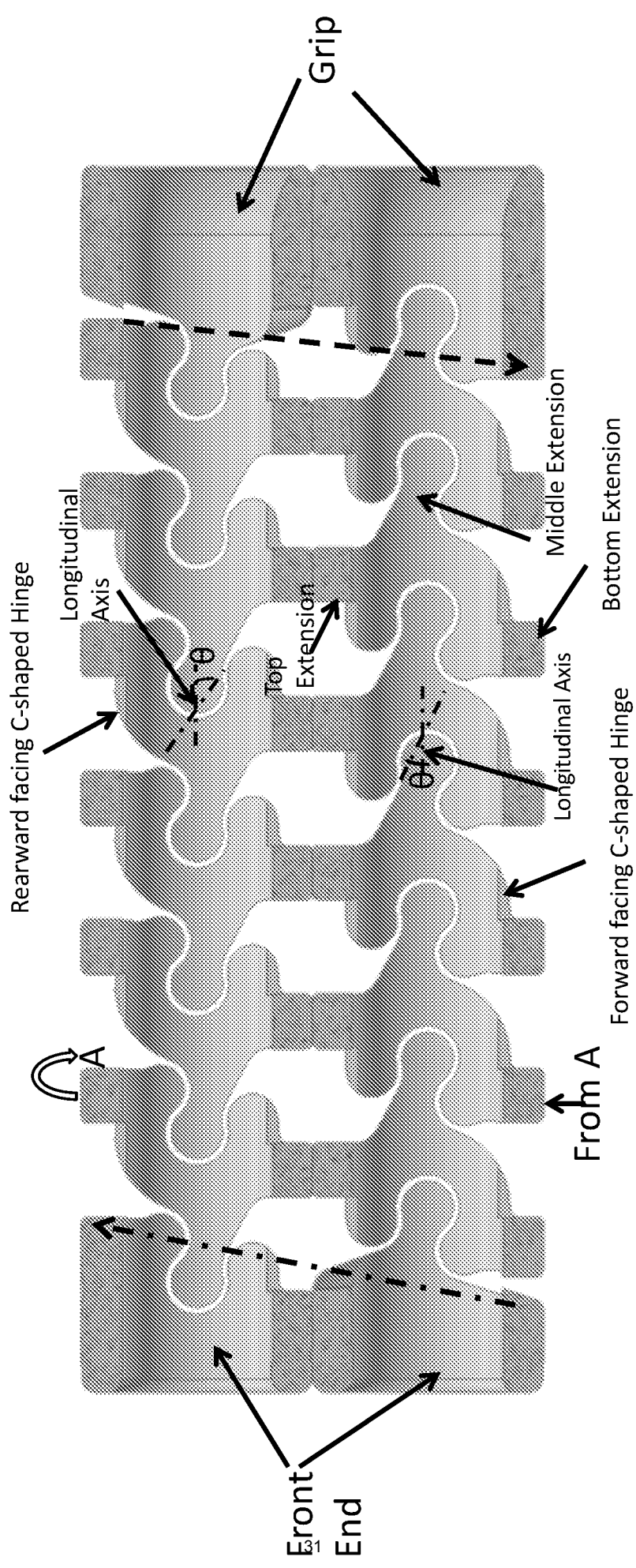


FIG. 7

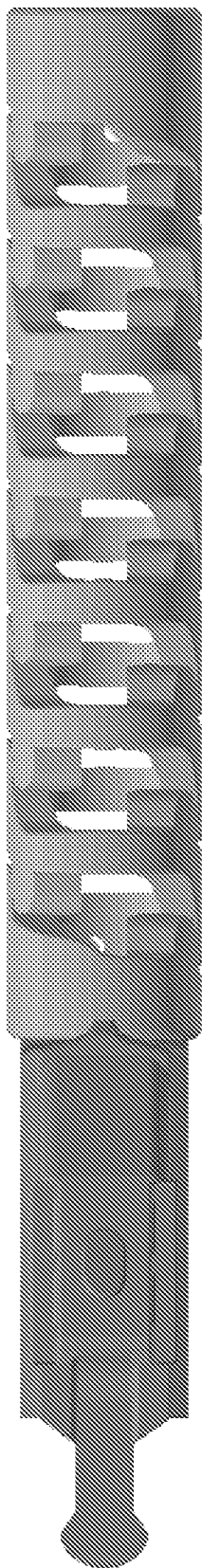
Individual Hinge Joint Construction laid out flat instead of in tubular shape



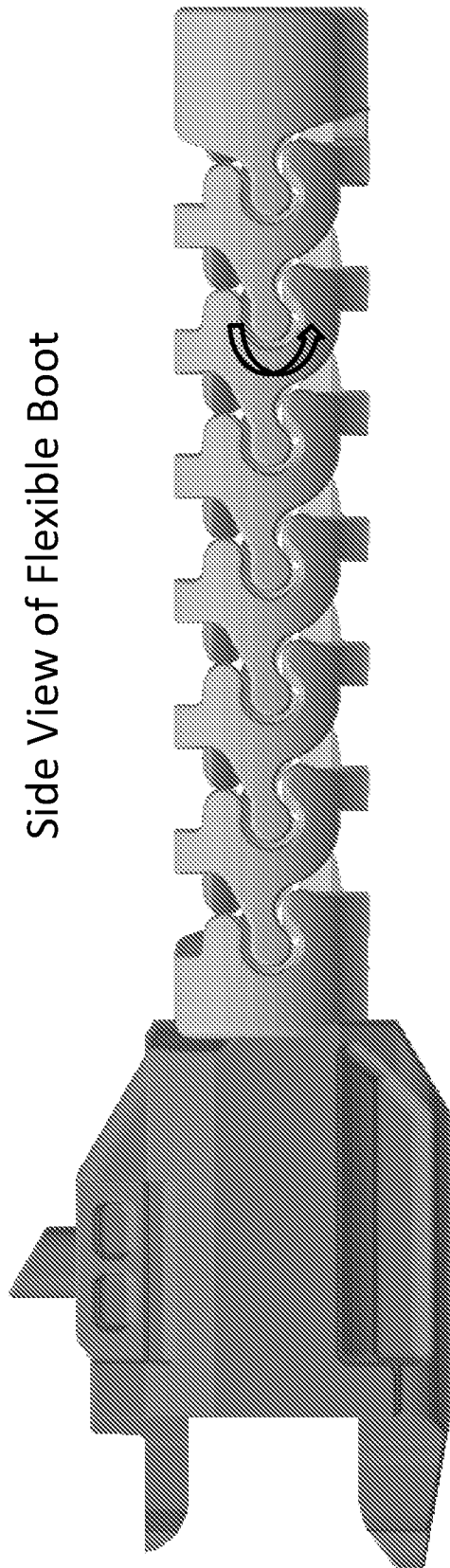
Base Hook attachment

FIG. 8

Top View of Flexible Boot



Side View of Flexible Boot



Section View

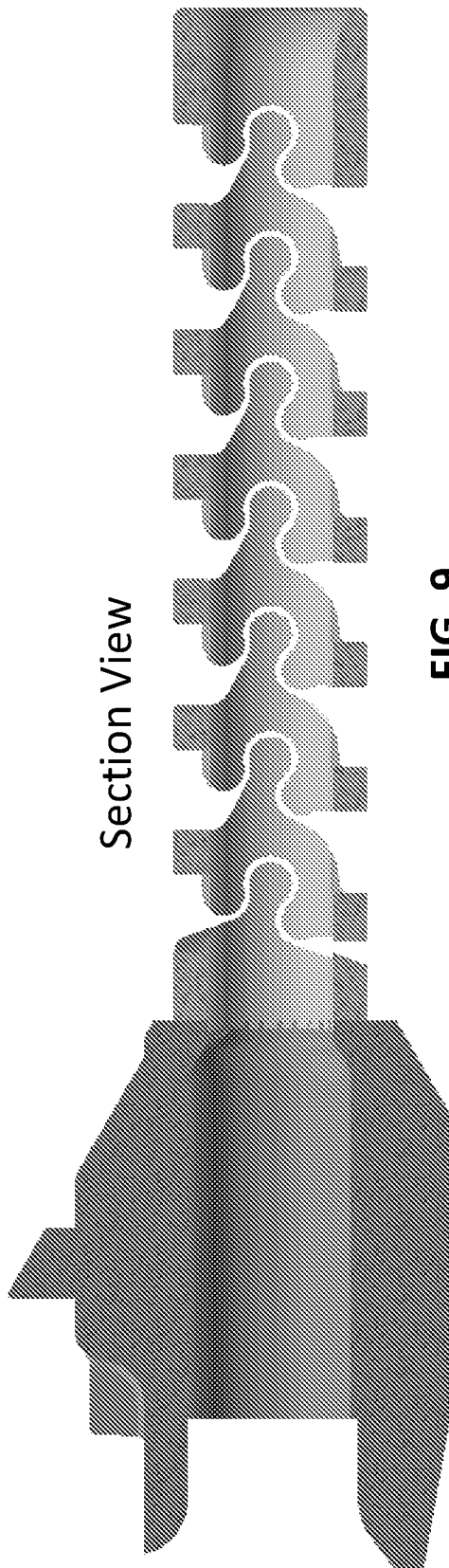


FIG. 9

Circuitous Interlocking push-pull Boot (Spiral Puzzle Boot)

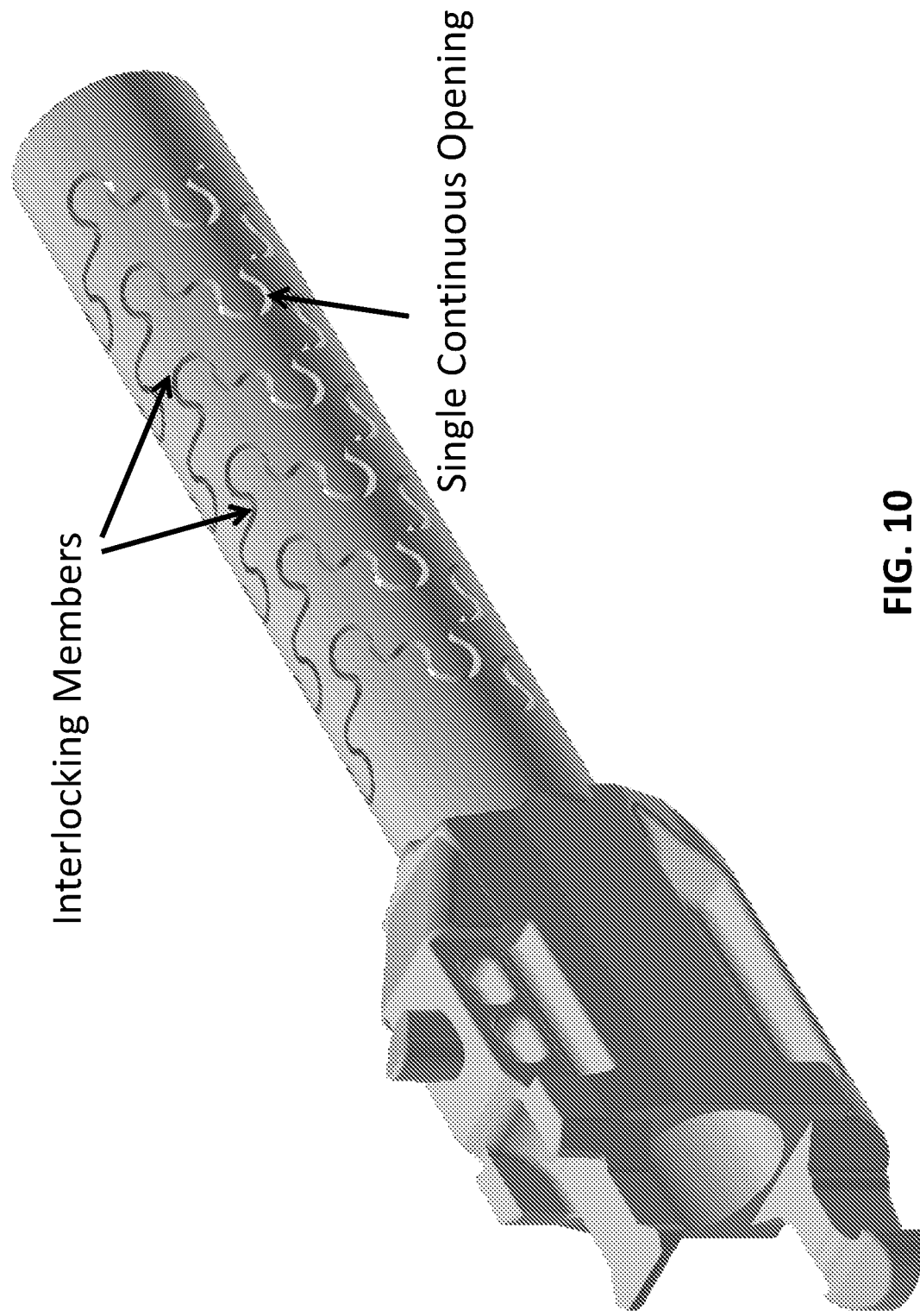
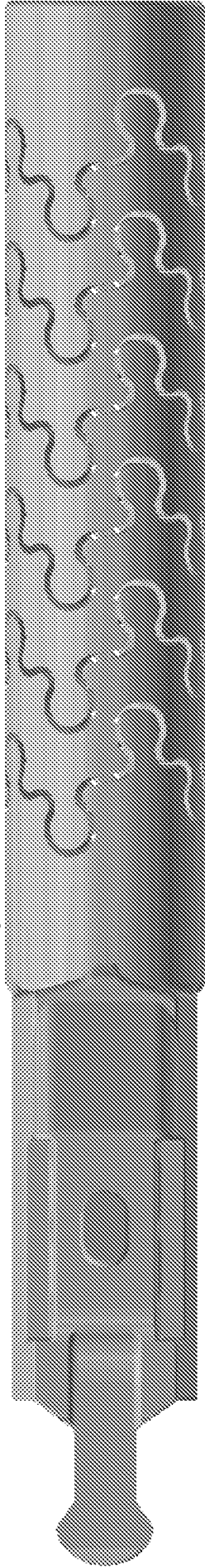
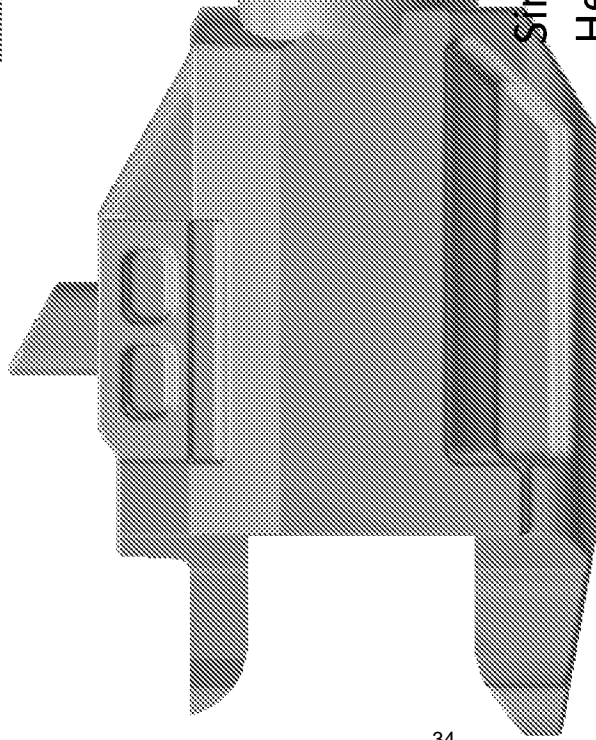


FIG. 10

Top View of Flexible Boot

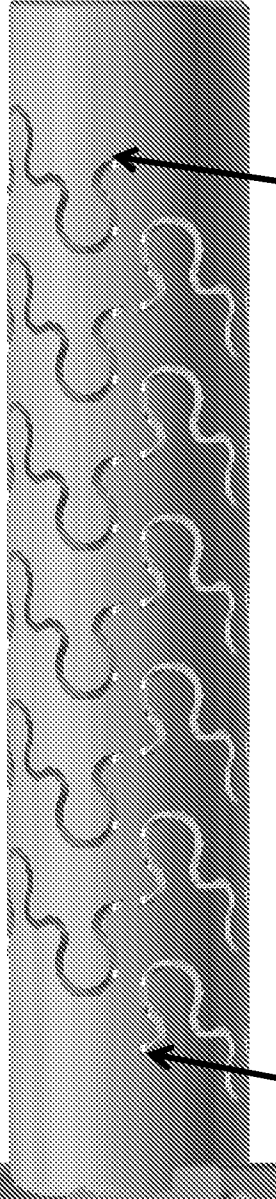


Side View of Flexible Boot



Single Opening Ends/Starts Here

Single Opening Starts/Ends Here



Section View

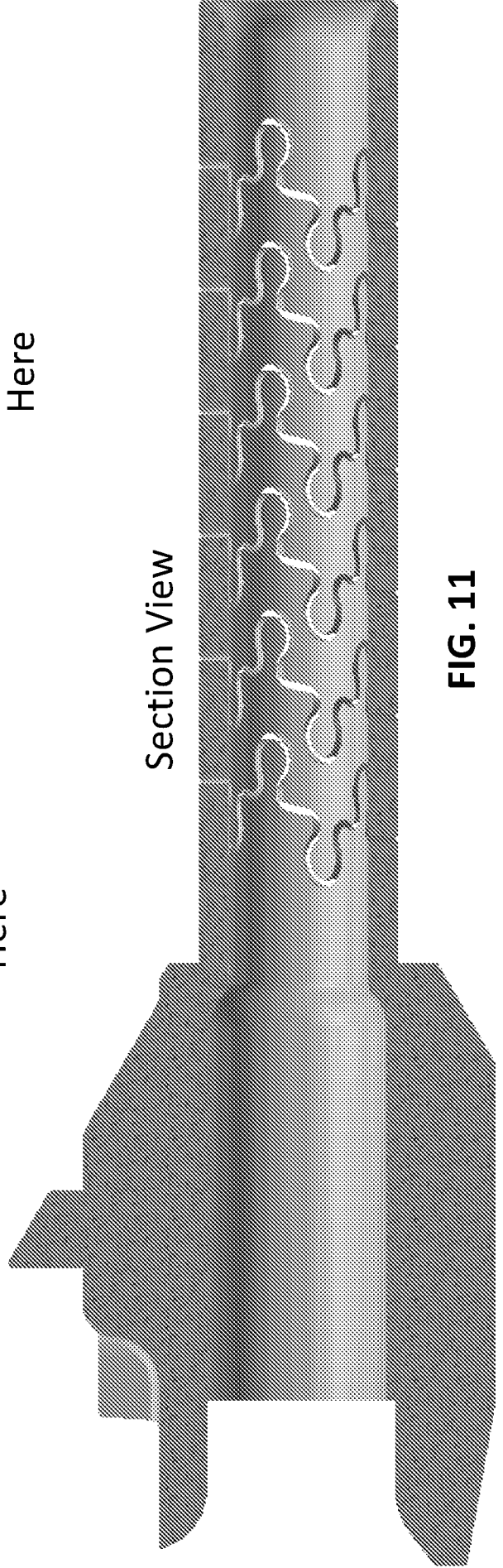


FIG. 11

Half U-Joint push-pull Boot

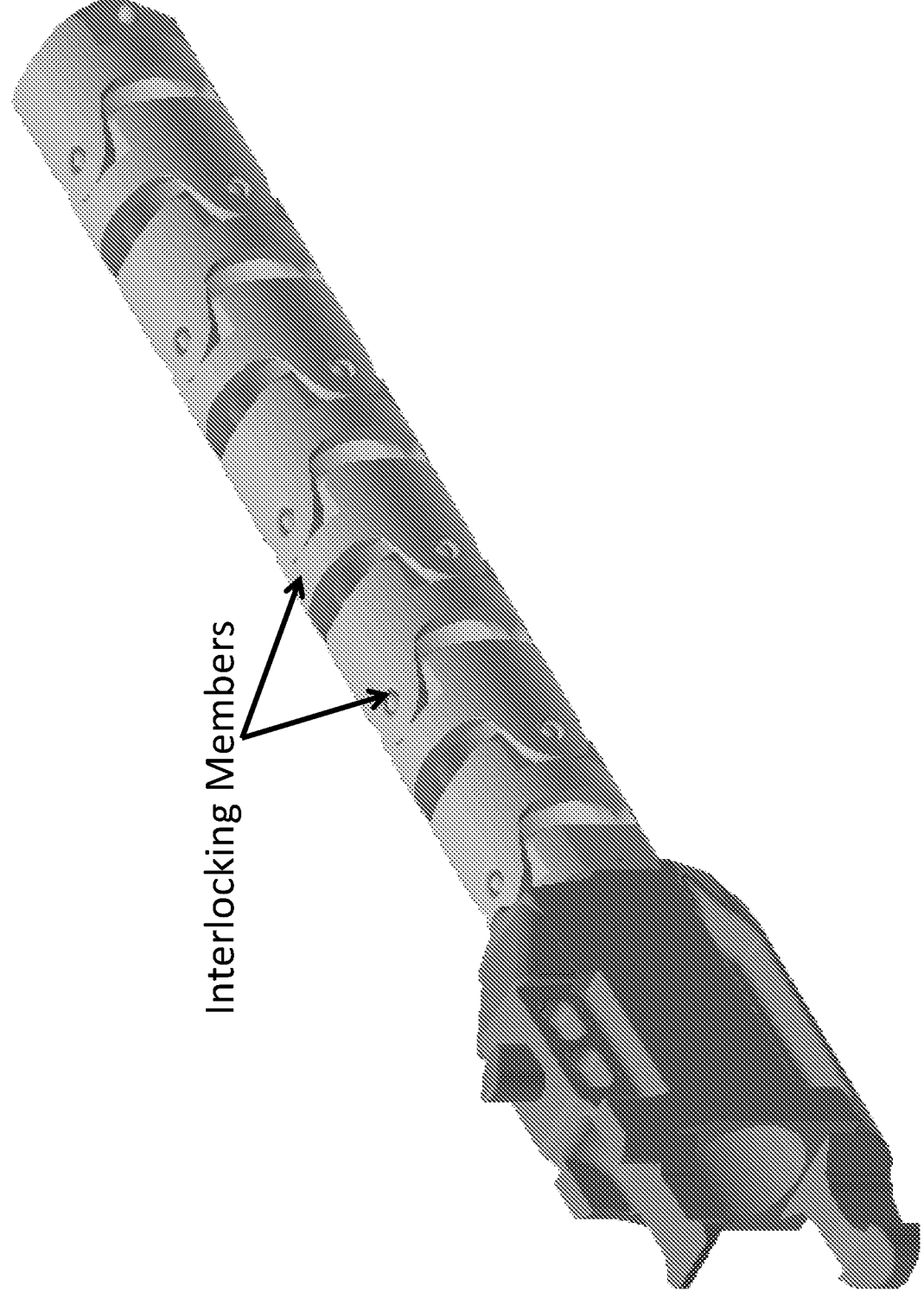
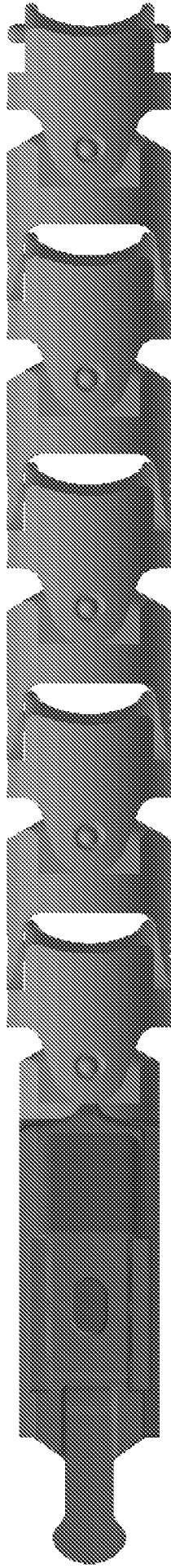


FIG. 12

Top View of Flexible Boot



Side View of Flexible Boot

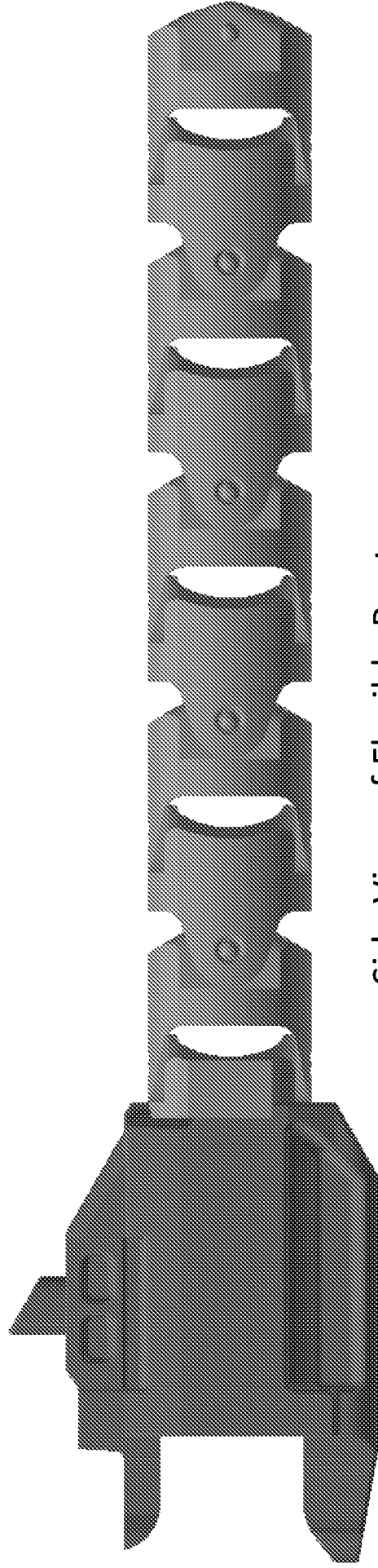


FIG. 13

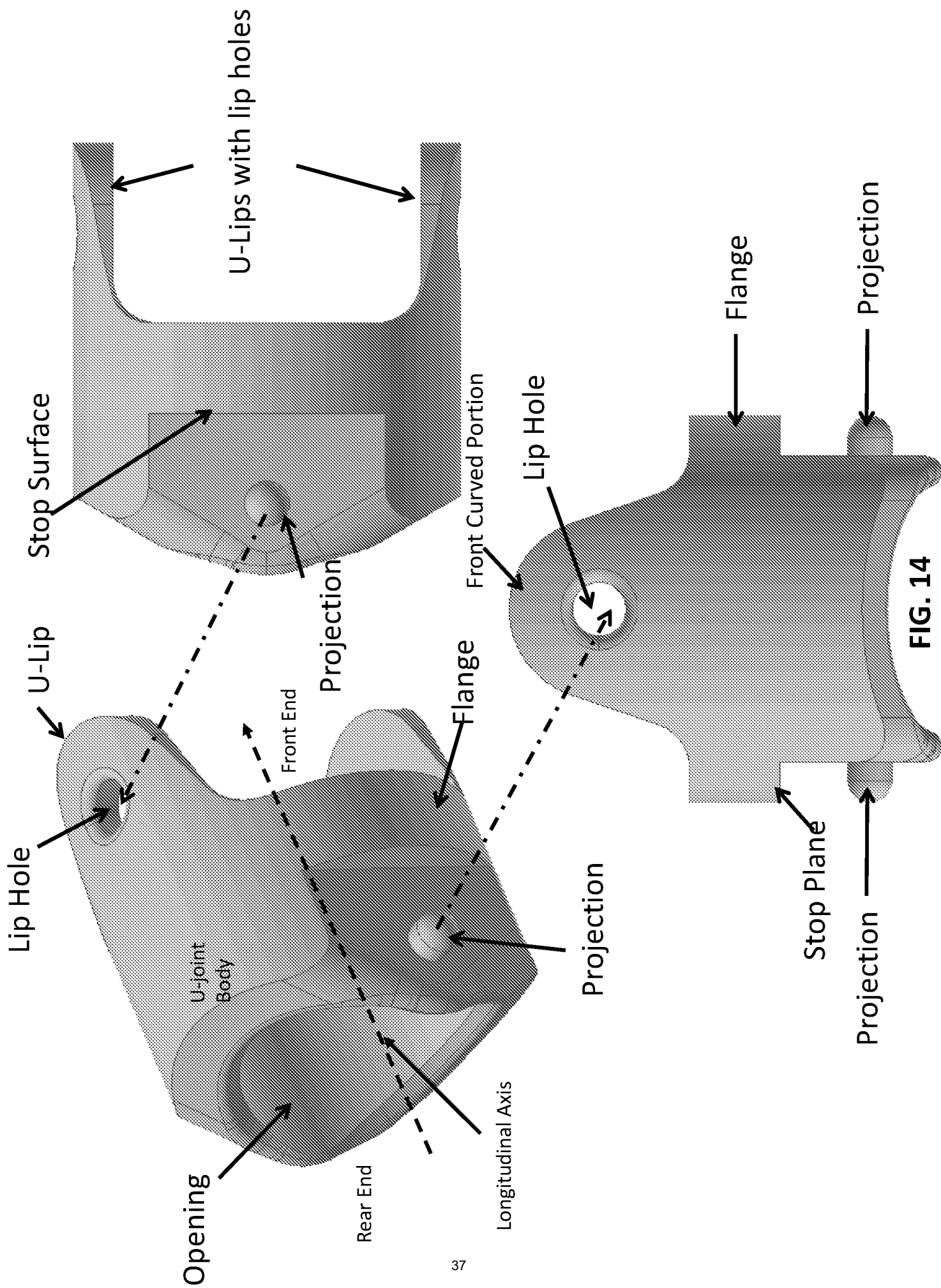


FIG. 14

Sixth Version – Forked Rib Design

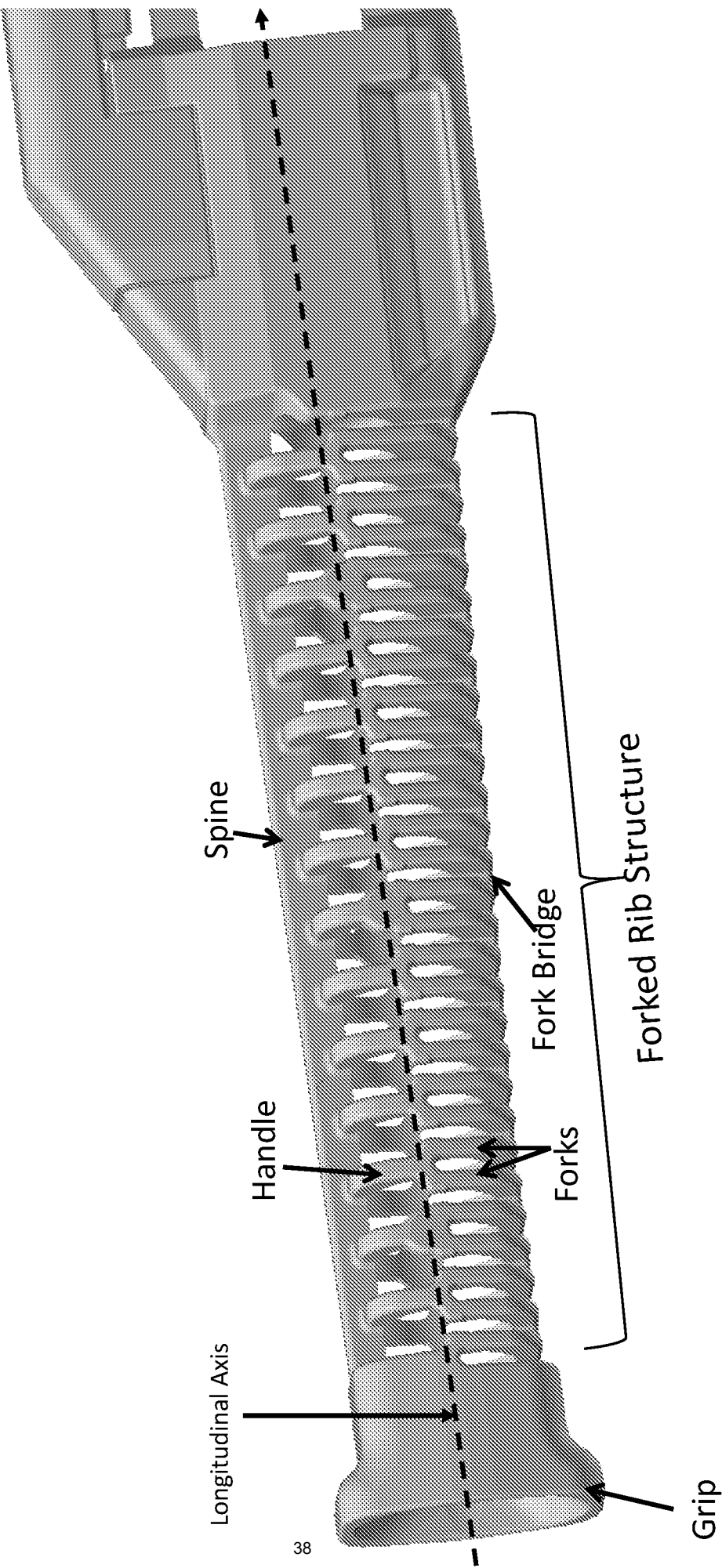


FIG. 15

Variation of the Sixth Version – no forked ribs

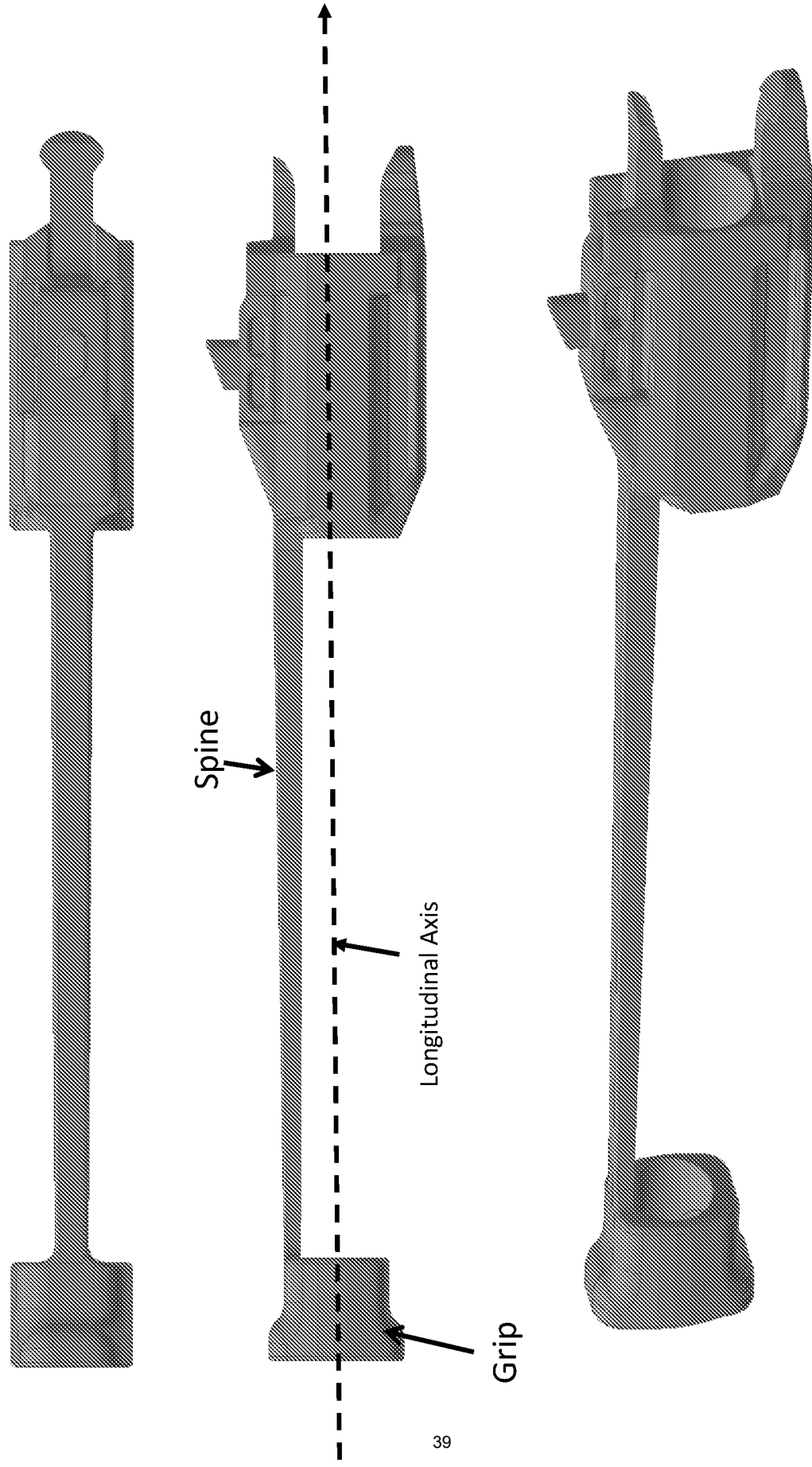
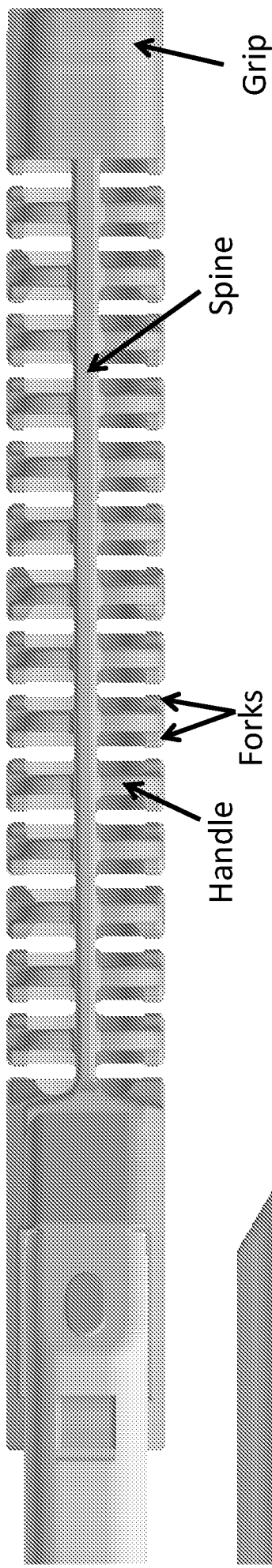
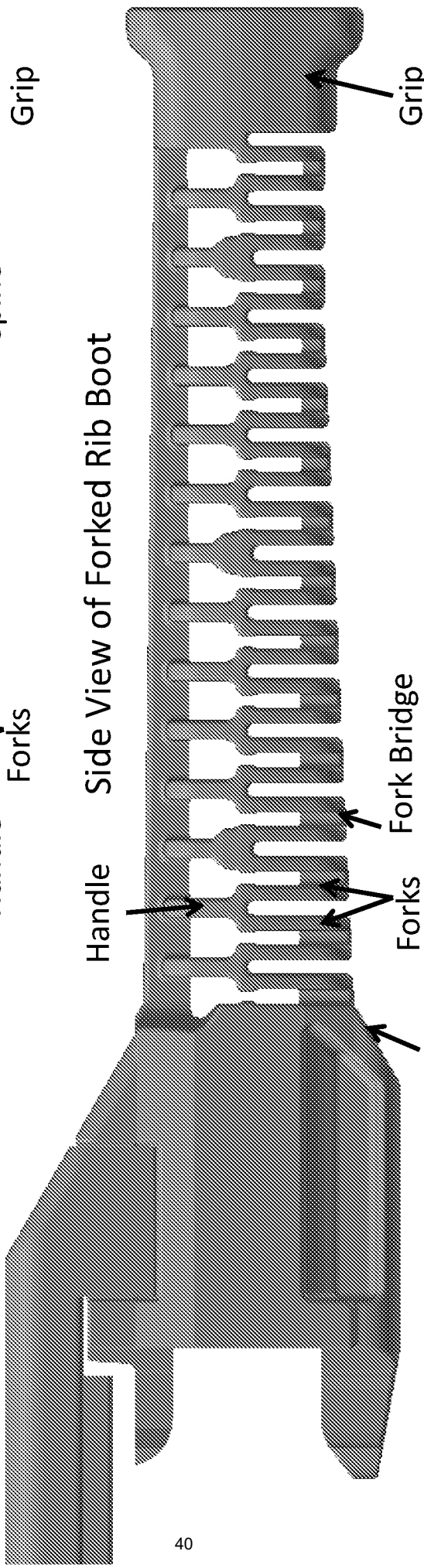


FIG. 15a

Top View of Forked Rib Boot



Side View of Forked Rib Boot



Bottom View of Forked Rib Boot

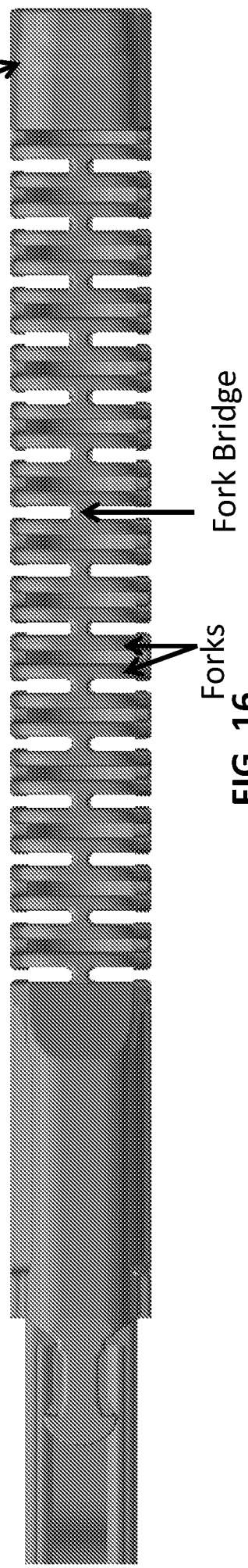


FIG. 16

Spiral Boot with Spine – variation of sixth version

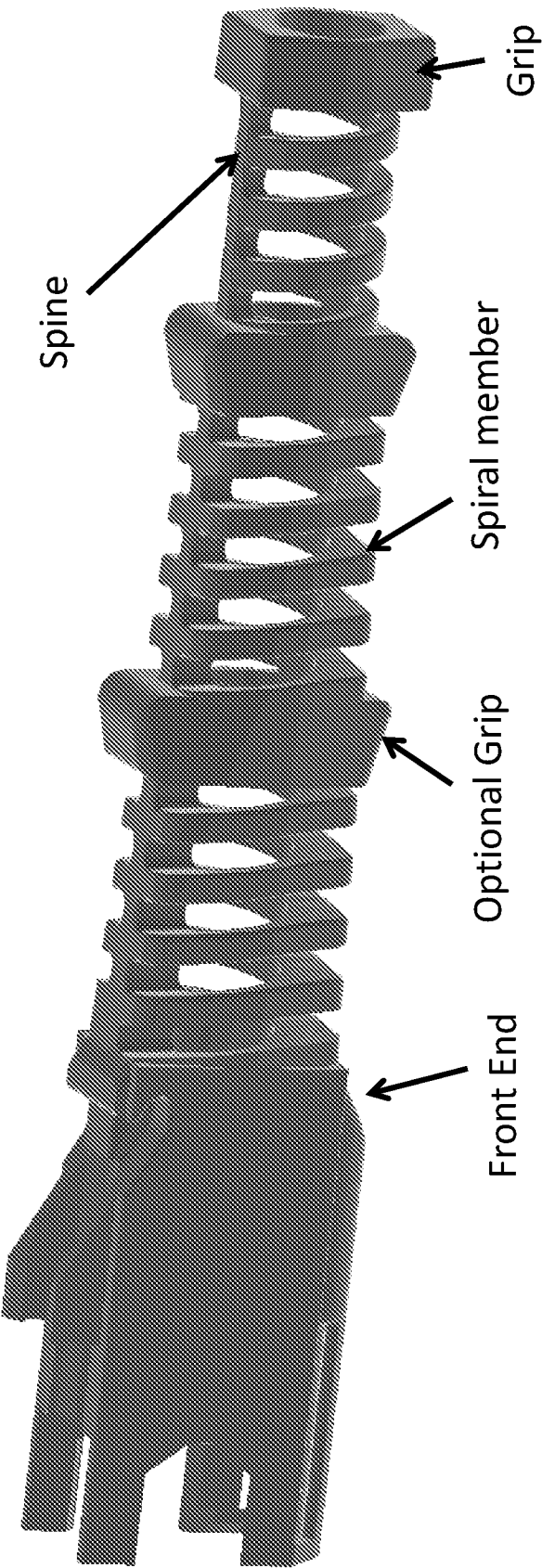


FIG. 16a

Side View of Spiral boot with spine

Spine

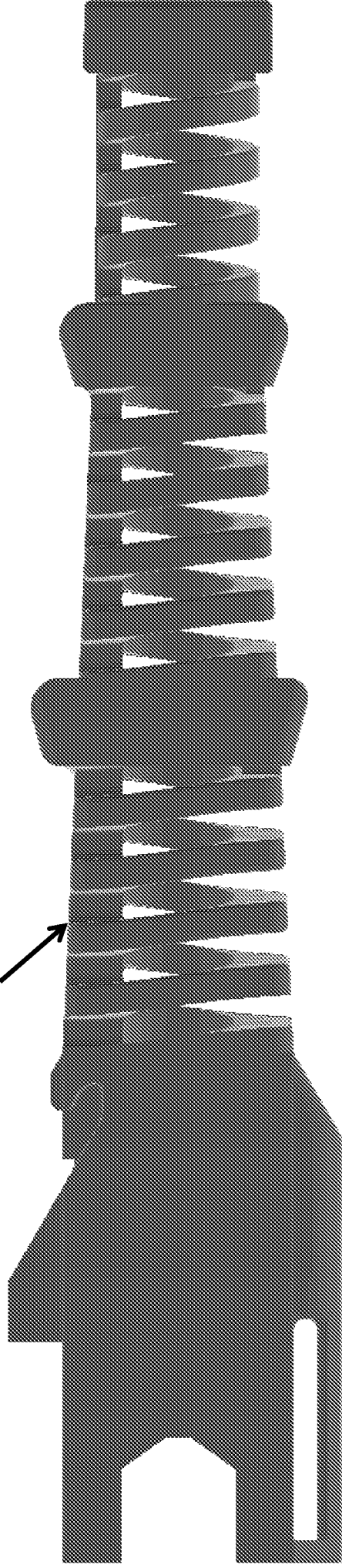


FIG. 16b

Bottom View of Spiral boot with spine

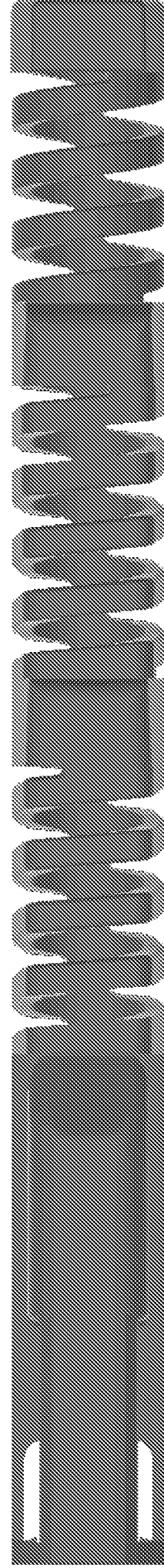
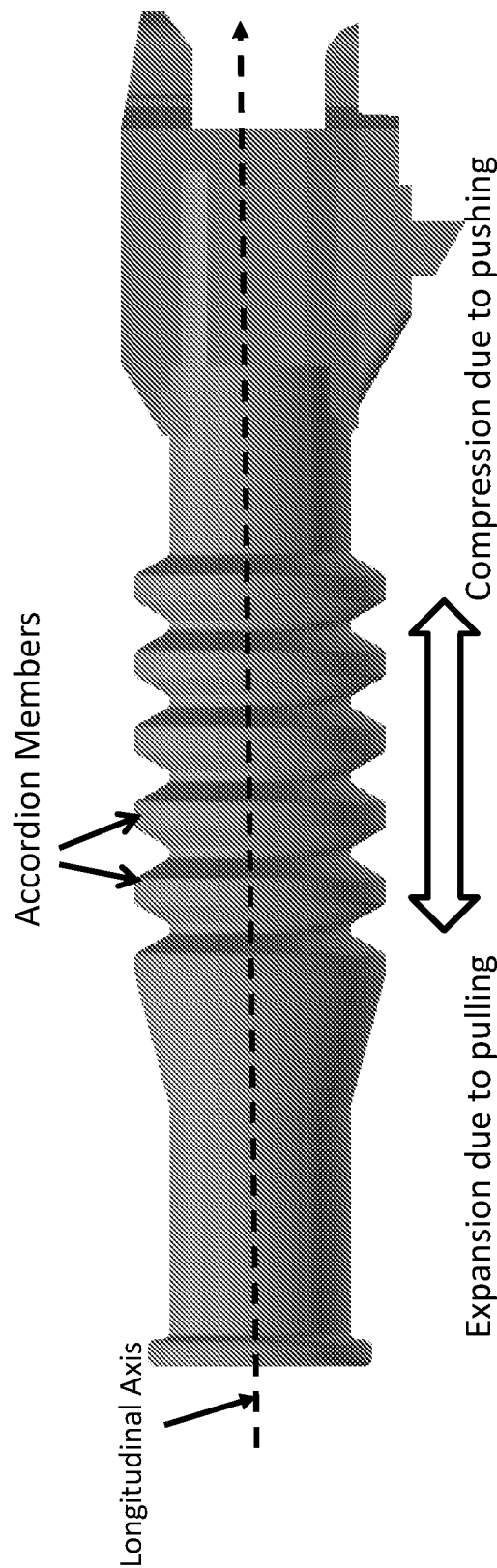


FIG. 16c

Seventh Version – Accordion Boot



Side View of Accordion Boot

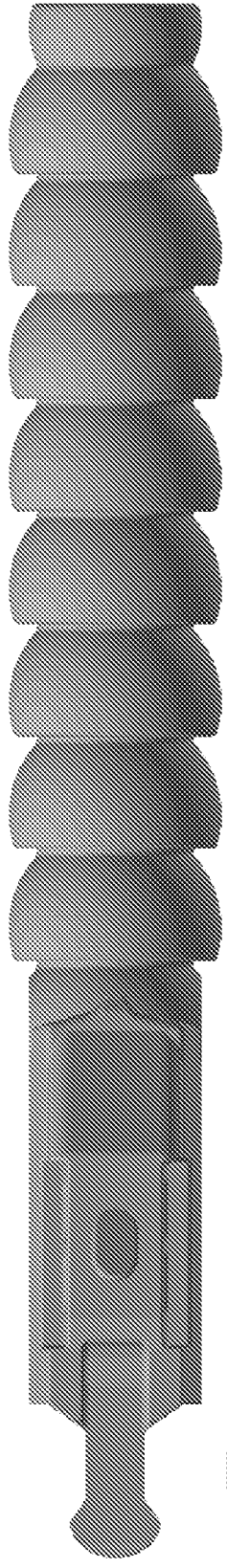
FIG. 17

Ball-Socket Push-Pull Boot

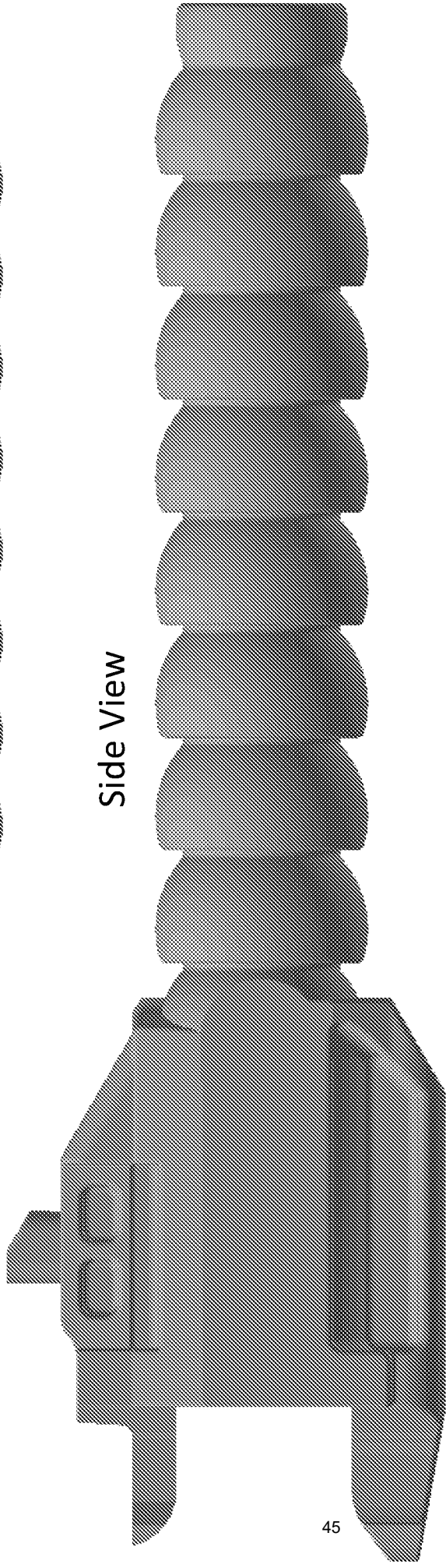


FIG. 18

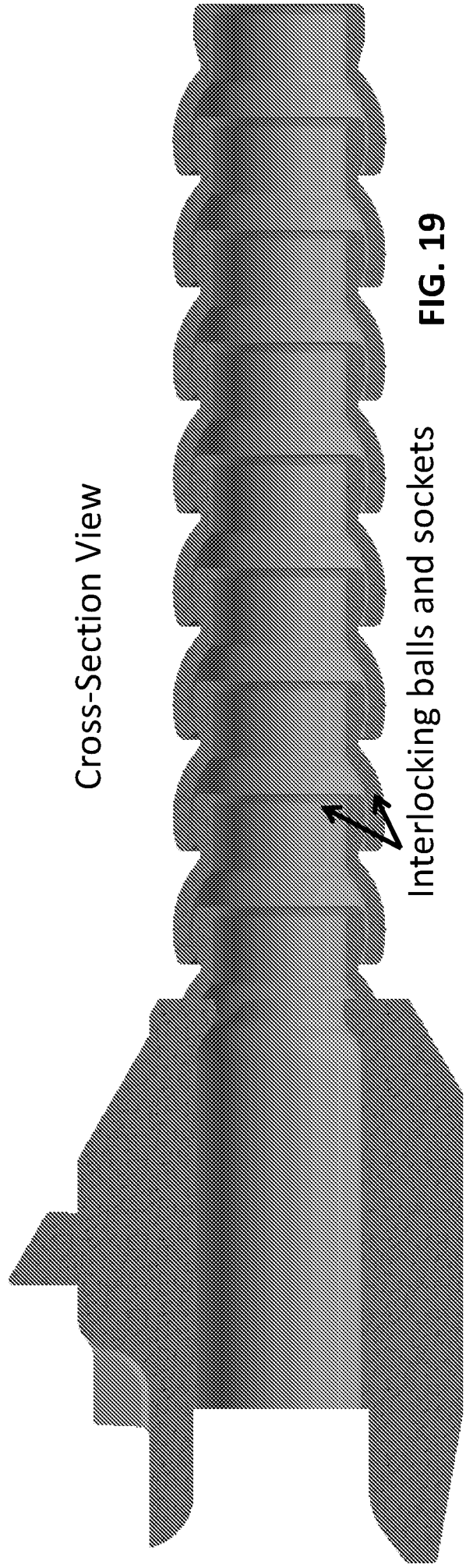
Top View



Side View



Cross-Section View



Interlocking balls and sockets

FIG. 19

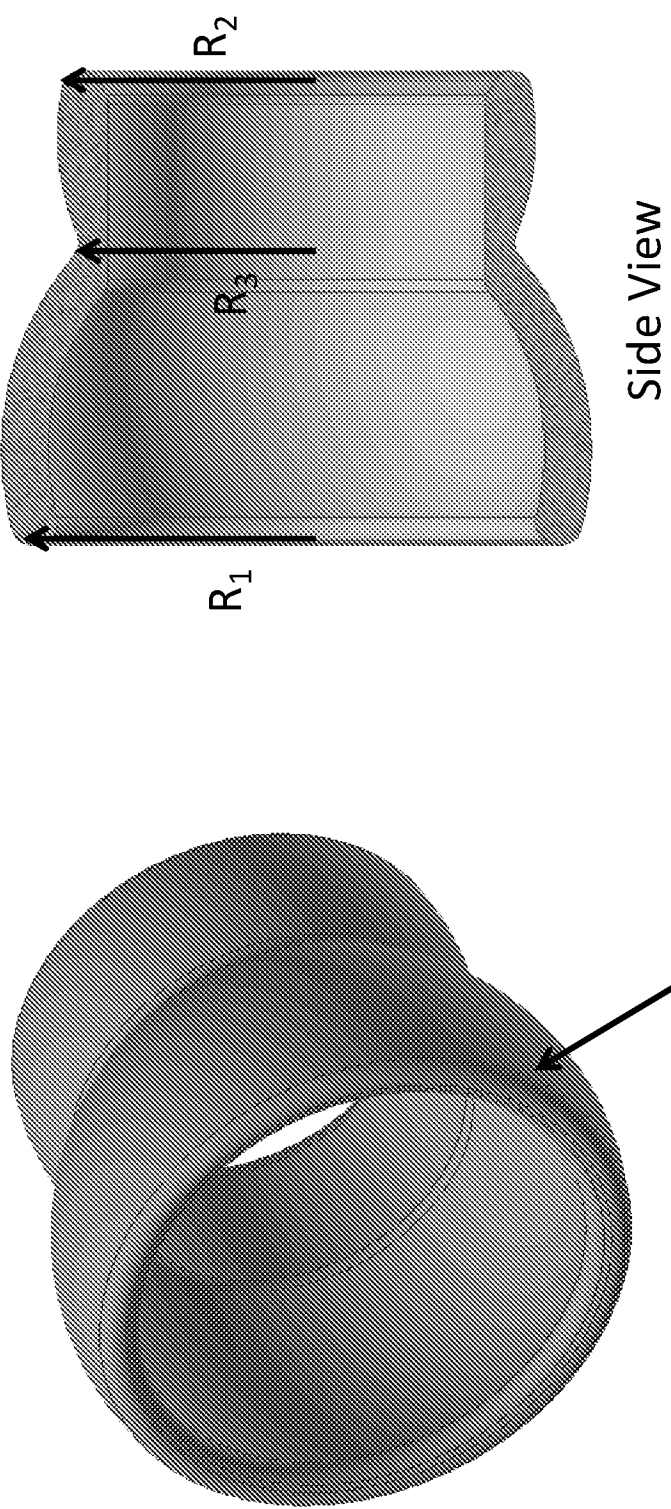


FIG. 20

Ninth version-Insert Molded Spring

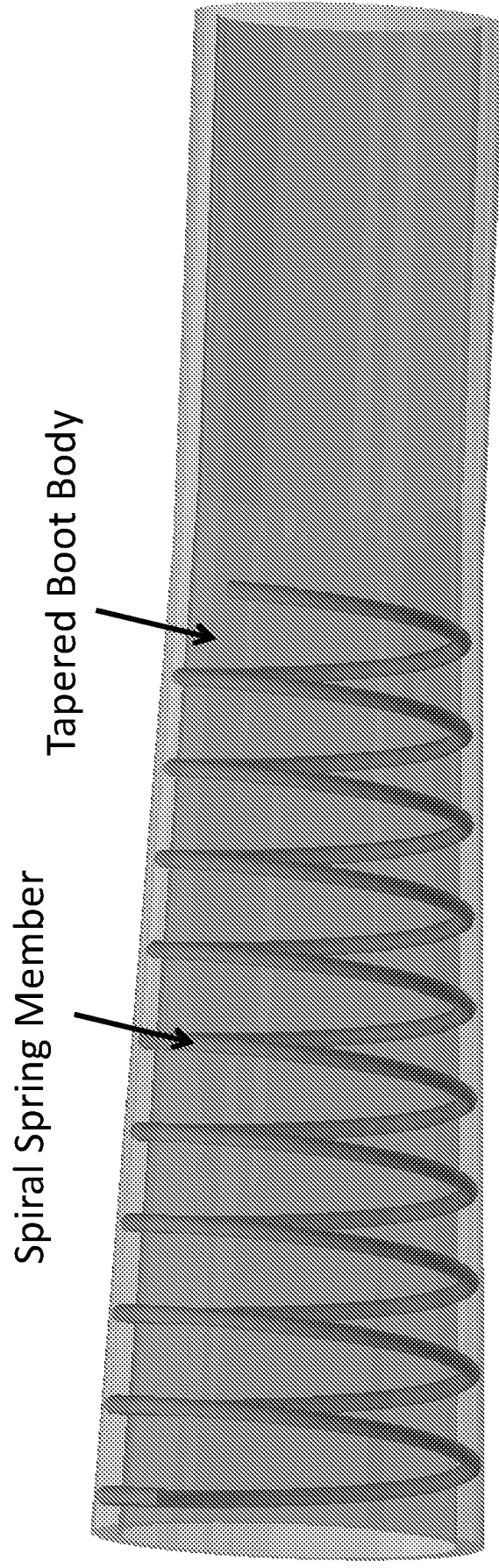


FIG. 21

Variation of Ninth Version - Insert Molded Wire

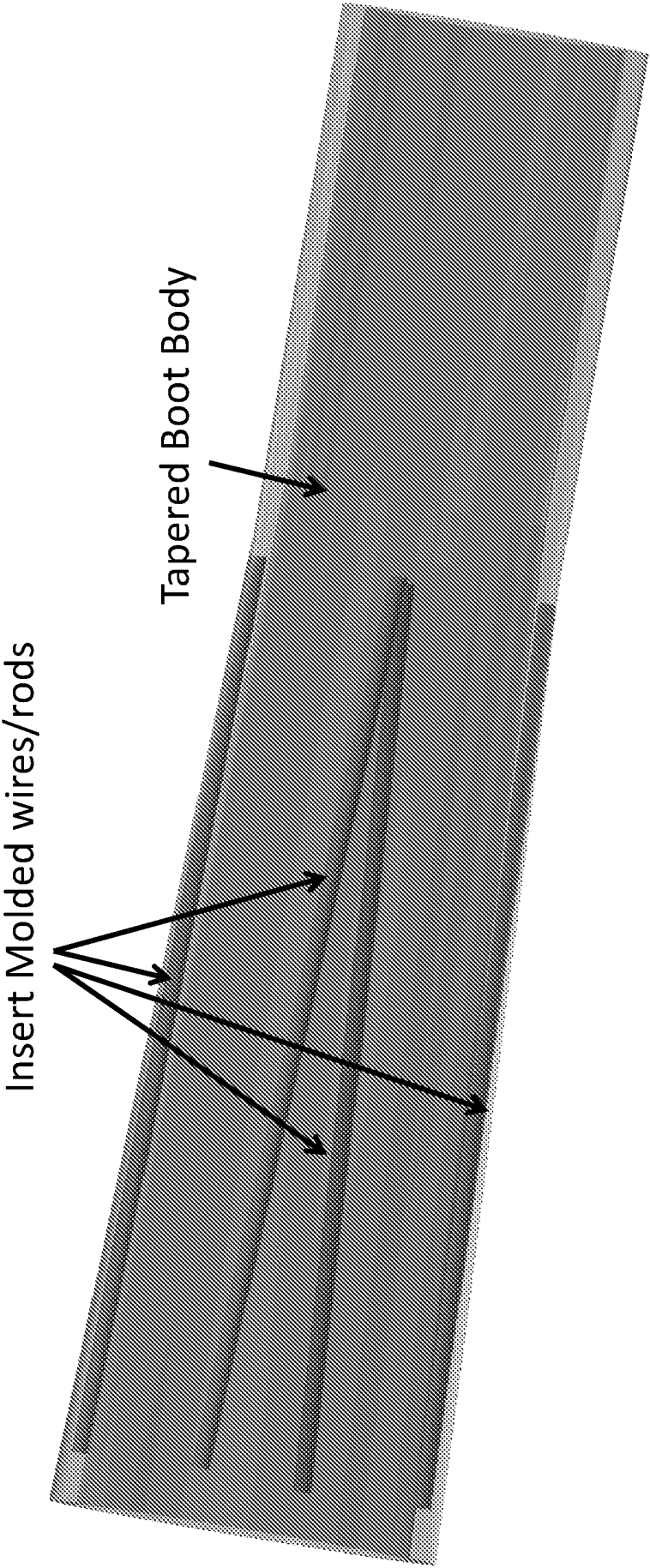


FIG. 22

Tenth version

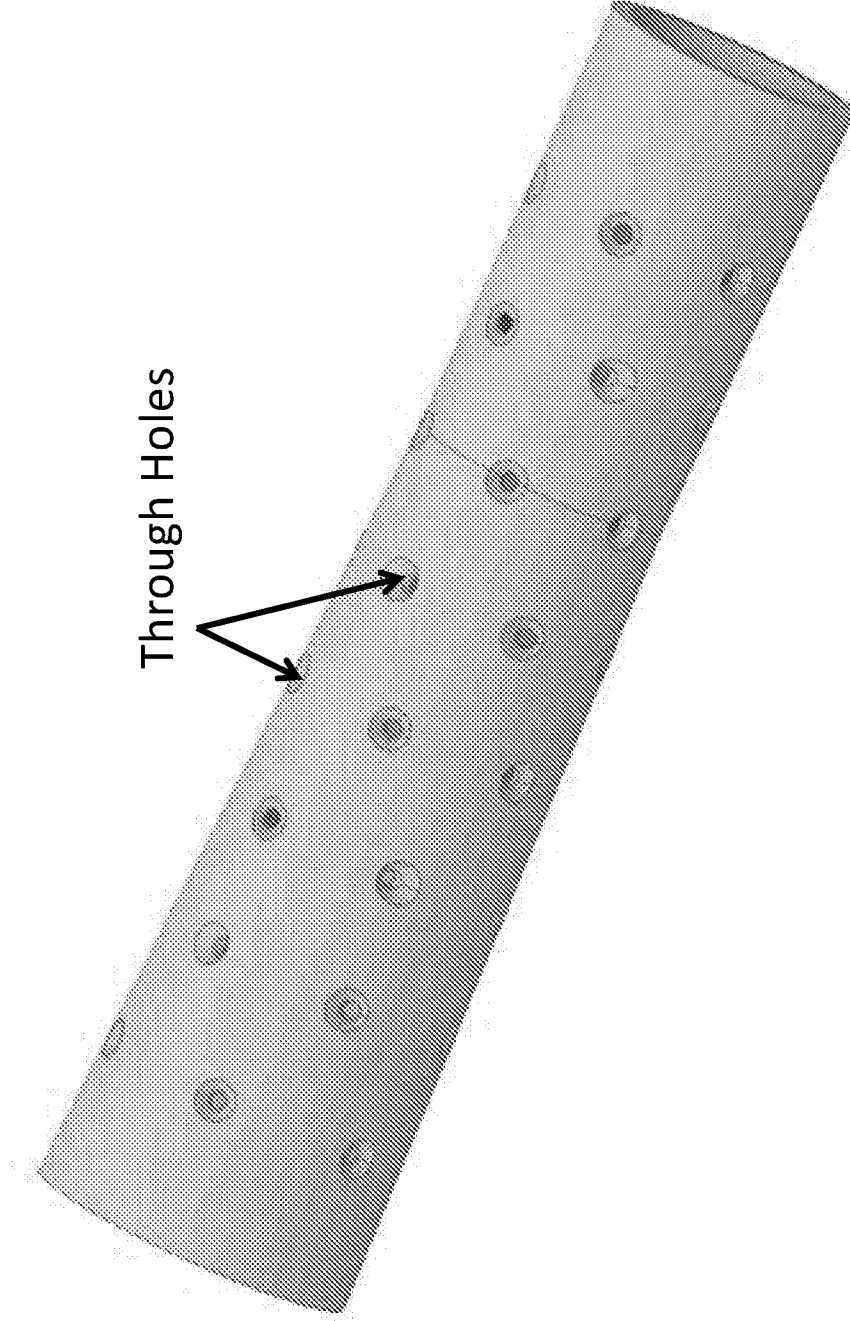


FIG. 23

Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		Flexible Push-Pull Boot		
First Named Inventor/Applicant Name:		Jason Higley		
Filer:		MICHAEL LEETZOW		
Attorney Docket Number:		USCO-105P		
Filed as Large Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
PROVISIONAL APPLICATION FILING	1005	1	280	280
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				280

Electronic Acknowledgement Receipt

EFS ID:	34876610
Application Number:	62793198
International Application Number:	
Confirmation Number:	2564
Title of Invention:	Flexible Push-Pull Boot
First Named Inventor/Applicant Name:	Jason Higley
Customer Number:	152017
Filer:	MICHAEL LEETZOW
Filer Authorized By:	
Attorney Docket Number:	USCO-105P
Receipt Date:	16-JAN-2019
Filing Date:	
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Application Type:	Provisional

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Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	\$280
RAM confirmation Number	011719INTEFSW17065800
Deposit Account	
Authorized User	

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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	USCO-105P_USPTO_AIA14_20190116_165712.pdf	1873982	no	9
			41763ed2d91405f867275f6af050fa9efc4b135f		
Warnings:					
Information:					
2	Specification	USCO105Spec.pdf	147561	no	11
			c8ba257612e7ce10634d62d4aabd972d01ffdbb0		
Warnings:					
Information:					
3	Drawings-other than black and white line drawings	USCO105DwgsFiling.pdf	7484897	no	26
			e564d47e8a10c68b3ee517125802ad94f2400689		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	29763	no	2
			34a8ce80b449e1ffc48d2d81360d3b58df9b7a7c		
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Document Date: 01/16/2019

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