



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 NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/844,424	05/07/2019	Jason Wersland	76840-5036

CONFIRMATION NO. 5923

IMPROPER CFR REQUEST

24574

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067



Date Mailed: 11/06/2019

RESPONSE TO REQUEST FOR CORRECTED FILING RECEIPT

Power of Attorney, Claims, Fees, System Limitations, and Miscellaneous

In response to your request for a corrected Filing Receipt, the Office is unable to comply with your request because:

- Any request to correct or update the name of the applicant must include an application data sheet (ADS) in compliance with 37 CFR 1.76 specifying the correct or updated name of the applicant in the applicant information section. Any request to change the applicant after an original applicant has been specified under 37 CFR 1.46(b) must include a new ADS in compliance with 37 CFR 1.76 specifying the applicant in the applicant information section and comply with 37 CFR 3.71 and 3.73. See 37 CFR 1.46(c).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/Itaba/



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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/844,424	05/07/2019	Jason Wersland	76840-5036

24574
JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

CONFIRMATION NO. 5923
IMPROPER CPOA LETTER



Date Mailed: 11/06/2019

NOTICE REGARDING POWER OF ATTORNEY

This is in response to the power of attorney filed 10/25/2019. The power of attorney in this application is not accepted for the reason(s) listed below:

- The power of attorney has not been accepted because the party who is giving power has not been identified. Power of attorney may only be signed by the applicant for patent (37 CFR 1.42) or the patent owner. A party who is not the applicant must become the applicant in accordance with 37 CFR 1.46(c) and appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. For a reissue application, reexamination proceeding, or supplemental examination proceeding, a patent owner who was not the applicant under 37 CFR 1.46 must appoint any power of attorney in compliance with 37 CFR 3.71 and 3.73. See 37 CFR 1.32(b)(4).

/Itaba/

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

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(c).

I hereby appoint:

☒

Practitioners associated with Customer Number:

24574

OR

☐

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

As attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignments documents attached to this form in accordance with 37 CFR 3.73(c).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(c) to:

☒

The address associated with Customer Number:

24574

OR

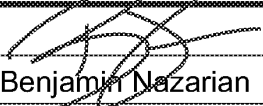
☐	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: THERAGUN, LLC
9420 Wilshire Blvd., 4th Floor
Beverly Hills, California 90212
United States of America

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

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

Signature		Date 3/29/2017
Name	Benjamin Nazarian	Telephone 310-300-4100
Title	Chief Executive 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 file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 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.

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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.

Electronic Acknowledgement Receipt	
EFS ID:	37570094
Application Number:	62844424
International Application Number:	
Confirmation Number:	5923
Title of Invention:	PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5036
Receipt Date:	25-OCT-2019
Filing Date:	07-MAY-2019
Time Stamp:	18:55:05
Application Type:	Provisional

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Assignee showing of ownership per 37 CFR 3.73	76840_5036_Statement373c.pdf	101472 c4bdae7262b4c2f0e69325a020513a4f41fa3ef	no	2

Warnings:

Information:					
2	Power of Attorney	General_Power_of_Attorney_Executed.pdf	995786 e791001c2edcfa58d212e4dad7830365a924458	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			1097258		
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. <u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a 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. <u>National Stage of an International Application under 35 U.S.C. 371</u> 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. <u>New International Application Filed with the USPTO as a Receiving Office</u> 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.					

STATEMENT UNDER 37 CFR 3.73(c)

Applicant/Patent Owner: Theragun, LLC
Application No./Patent No.: 62/844,424 Filed/Issue Date: May 7, 2019
Titled: PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE
Theragun, LLC, a limited liability company
(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 050761, Frame 0459, 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: _____ To: _____

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

2. 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.

[Page 1 of 2]

This collection of information is required by 37 CFR 3.73(b). 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 1.11 and 1.14. This collection is estimated to take 12 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.

STATEMENT UNDER 37 CFR 3.73(c)

3. 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.

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.

/Brennan C. Swain/

Signature

Brennan C. Swain, Esq.

Printed or Typed Name

October 25, 2019

Date

43175

Title or Registration Number



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
62/844,424	05/07/2019		140	76840-5036		

24574

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

CONFIRMATION NO. 5923
UPDATED FILING RECEIPT



0000000111581182

Date Mailed: 10/02/2019

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 FIRST INVENTOR, 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 corrected Filing Receipt identifying the requested changes, preferably by including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Jason Wersland, Manhattan Beach, CA;
Benjamin Nazarian, Santa Monica, CA;
Jaime Sanchez Solana, Los Angeles, CA;
Trent Hernandez, Los Angeles, CA;
Harald Quintus-Bosz, Boston, MA;
Anthony Parker, Boston, MA;
Chris McCaslin, San Francisco, CA;
Josh Kinsley, San Diego, CA;

Applicant(s)

Jason Wersland, Manhattan Beach, CA;
Benjamin Nazarian, Santa Monica, CA;
Jaime Sanchez Solana, Los Angeles, CA;
Trent Hernandez, Los Angeles, CA;
Harald Quintus-Bosz, Boston, MA;
Anthony Parker, Boston, MA;
Chris McCaslin, San Francisco, CA;
Josh Kinsley, San Diego, CA;

Power of Attorney:

Brennan Swain--43175

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

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

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

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

PERCUSSIVE MESSAGE DEVICE AND METHOD OF USE

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 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.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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P.O. Box 1450
Alexandria, Virginia 22313-1450
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
62/844,424	05/07/2019	Jason Wersland	76840-5036

CONFIRMATION NO. 5923

24574
JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

**37 CFR 1.48(d)
ACKNOWLEDGEMENT LETTER**



Date Mailed: 10/02/2019

NOTICE OF ACCEPTANCE OF REQUEST UNDER 37 CFR 1.48(d)

This is in response to the applicant's request under 37 CFR 1.48(d) submitted on 09/30/2019.

">The request under 37 CFR 1.48(d) to correct the inventorship, to correct or update the name of an inventor, or to correct the order of names of joint inventors is accepted.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/byemane-brehan/

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of:	Confirmation No.	5923
Jason Wersland, et al.	Group Art Unit:	TBD
Serial No.: 62/844,424	Examiner:	TBD
Filed: May 7, 2019	Customer No.:	24574
For: PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE	Docket No.:	76840-5036

TRANSMITTAL OF SUPPLEMENTAL PROVISIONAL COVER SHEET

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir or Madam:

Applicant hereby submits a Supplemental Provisional Cover Sheet, deleting the following inventor (Inventor #4):

Name: **Rene Oehlerking**

City/State/Country of Residence: **Los Angeles/CA/US**

Applicant believes the enclosed Provisional Cover Sheet is in compliance with 37 CFR 1.51(c)(1).

It is believed that no additional fee is due for submitting this document. However, in the event a fee is required, the Commissioner is authorized to charge any amounts due or credit any overpayments in connection with this matter to Deposit Account No. 10-0440.

Respectfully submitted,

Dated: September 30, 2019

/Brennan C. Swain/
BRENNAN C. SWAIN
USPTO Reg. No. 43,175

JEFFER MANGELS BUTLER & MITCHELL LLP
Seventh Floor
1900 Avenue of the Stars
Los Angeles, CA 90067
Tel: (310) 203-8080
patentdocket@jmbm.com

Enclosure: Supplemental Provisional Cover Sheet

Electronic Acknowledgement Receipt	
EFS ID:	37324127
Application Number:	62844424
International Application Number:	
Confirmation Number:	5923
Title of Invention:	PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5036
Receipt Date:	30-SEP-2019
Filing Date:	07-MAY-2019
Time Stamp:	18:18:46
Application Type:	Provisional

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	76840_5036_Corrected_Prov_Cvr.pdf	47477 21296ec50ef42106b3447276c896f4748b893774	no	4

Warnings:

This is not a USPTO supplied Provisional Cover Sheet SB16 form.

Information:

2	Miscellaneous Incoming Letter	76840_5036_Transmittal_Letter_Corrected_Prov_Cvr.pdf	127983	no	1
			f11bd5b2cdc591d1b3b2e45965006ff546035ab4		

Warnings:

Information:

Total Files Size (in bytes):	175460
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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 a 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.

Doc Code: **TR.PROV**

Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (02-18)

Approved for use through 11/30/2020. OMB 0651-0032

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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Provisional Application for Patent Cover Sheet					
This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)					
Inventor(s)					
Inventor 1					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Jason		Wersland	Manhattan Beach	CA	US
Inventor 2					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Benjamin		Nazarian	Santa Monica	CA	US
Inventor 3					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Jaime	Sanchez	Solana	Los Angeles	CA	US
Inventor 4					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Rene		Oehlerking	Los Angeles	CA	US
Inventor 5					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Trent		Hernandez	Los Angeles	CA	US
Inventor 6					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Harald		Quintus-Bosz	Boston	MA	US
Inventor 7					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Anthony		Parker	Boston	MA	US
Inventor 8					Remove
Given Name	Middle Name	Family Name	City	State	Country ;
Chris		McCaslin	San Francisco	CA	US

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Inventor 9					Remove	
Given Name	Middle Name	Family Name	City	State	Country ;	
Josh		Kinsley	San Diego	CA	US	
All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add	
Title of Invention		PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE				
Attorney Docket Number (if applicable)		76840-5036				
Correspondence Address						
Direct all correspondence to (select one):						
☒ The address corresponding to Customer Number			☐ Firm or Individual Name			
Customer Number			24574			

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.	
☒ No.	
☐ Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:	
☐ Yes, the invention was under a contract with an agency of the United States Government. The name of the U.S. Government agency and Government contract number are:	

Entity Status**Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29**

- ☒ Applicant asserts small entity status under 37 CFR 1.27
- ☐ Applicant certifies micro entity status under 37 CFR 1.29. Applicant must attach form PTO/SB/15A or B or equivalent.
- ☐ No

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Signature

Please see 37 CFR 1.4(d) for the form of the signature.

Signature	/brennan c. swain/			Date (YYYY-MM-DD)	2019-05-06
First Name	Brennan	Last Name	Swain	Registration Number (If appropriate)	43175

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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 disclosure of these records is required by the Freedom of Information Act.
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 inspection 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.



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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
62/844,424	05/07/2019		140	76840-5036		

CONFIRMATION NO. 5923

24574

JEFFER, MANGELS, BUTLER & MITCHELL, LLP
1900 AVENUE OF THE STARS, 7TH FLOOR
LOS ANGELES, CA 90067

FILING RECEIPT



0000000108148018

Date Mailed: 05/14/2019

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 FIRST INVENTOR, 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 corrected Filing Receipt identifying the requested changes, preferably by including a properly marked-up ADS showing the changes with strike-through for deletions and underlining for additions. If you received a "Notice to File Missing Parts" or other Notice requiring a response for this application, please submit any request for correction 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 provided that the request is grantable.

Inventor(s)

Jason Wersland, Manhattan Beach, CA;
Benjamin Nazarian, Santa Monica, CA;
Jaime Sanchez Solana, Los Angeles, CA;
Rene Oehlerking, Los Angeles, CA;
Trent Hernandez, Los Angeles, CA;
Harald Quintus-Bosz, Boston, MA;
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Rene Oehlerking, Los Angeles, CA;
Trent Hernandez, Los Angeles, CA;
Harald Quintus-Bosz, Boston, MA;
Anthony Parker, Boston, MA;
Chris McCaslin, San Francisco, CA;
Josh Kinsley, San Diego, CA;

Power of Attorney:

Brennan Swain--43175

Permission to Access Application via Priority Document Exchange: No

Permission to Access Search Results: No

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: 05/13/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/844,424**

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

Non-Publication Request: No

Early Publication Request: No

**** SMALL ENTITY ****

Title

PERCUSSIVE MESSAGE DEVICE AND METHOD OF USE

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

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page 2 of 4

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Application Number: 62844424

Document Date: 05/07/2019

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Provisional Application for Patent Cover Sheet

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c)

Inventor(s)

Inventor 1

Remove

Given Name	Middle Name	Family Name	City	State	Country i
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Inventor 2

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Benjamin		Nazarian	Santa Monica	CA	US

Inventor 3

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Jaime	Sanchez	Solana	Los Angeles	CA	US

Inventor 4

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Rene		Oehlerking	Los Angeles	CA	US

Inventor 5

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Trent		Hernandez	Los Angeles	CA	US

Inventor 6

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Harald		Quintus-Bosz	Boston	MA	US

Inventor 7

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Anthony		Parker	Boston	MA	US

Inventor 8

Remove

Given Name	Middle Name	Family Name	City	State	Country i
Chris		McCaslin	San Francisco	CA	US

Doc Code: **TR.PROV**

Document Description: Provisional Cover Sheet (SB16)

PTO/SB/16 (02-18)

Approved for use through 11/30/2020. OMB 0651-0032

U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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Inventor 9					Remove	
Given Name	Middle Name	Family Name	City	State	Country	
Josh		Kinsley	San Diego	CA	US	
All Inventors Must Be Listed – Additional Inventor Information blocks may be generated within this form by selecting the Add button.					Add	
Title of Invention		PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE				
Attorney Docket Number (if applicable)		76840-5036				
Correspondence Address						
Direct all correspondence to (select one):						
☒ The address corresponding to Customer Number			☐ Firm or Individual Name			
Customer Number			24574			

The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.	
☒ No.	
Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is:	
Yes, the invention was under a contract with an agency of the United States Government. The name of the U.S. Government agency and Government contract number are:	

Entity Status**Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29**

- ☒ Applicant asserts small entity status under 37 CFR 1.27
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Signature	/brennan c. swain/			Date (YYYY-MM-DD)	2019-05-06
First Name	Brennan	Last Name	Swain	Registration Number (If appropriate)	43175

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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.
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6. A record in this system of records may be disclosed, as a routine use, to a n other 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)).
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PERCUSSIVE MESSAGE DEVICE AND METHOD OF USE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is related to U.S. Patent Application No. 62/785,151, filed December 26, 2018, U.S. Patent Application No. 15/920,322, filed March 13, 2018, which is a continuation-in-part of U.S. Patent Application No. 15/458,920, filed on March 14, 2017, which is a continuation-in-part of U.S. Patent Application No. 15/186,859, filed on June 20, 2016, which claims the benefit of U.S. Provisional Patent Application No. 62/182,525, filed on June 20, 2015, all of which are hereby incorporated by reference in their entireties.

FIELD OF THE INVENTION

[0002] The present invention relates generally to massage devices and more particularly to a massage device that provides reciprocating motion.

BACKGROUND OF THE INVENTION

[0003] Massage devices often provide ineffective massages that are superficial and do not provide any real benefit. Accordingly, there is a need for an improved massage device.

SUMMARY OF THE PREFERRED EMBODIMENTS

[0004] In accordance with a first aspect of the present invention there is provided a massage device that includes a housing, an electrical input, a motor, a switch in electrical communication with the electrical input and the motor and configured to selectively provide power from the electrical input to the motor, an actuated output operatively connected to the motor and configured to reciprocate in response to activation of the motor, and a treatment structure operatively connected to a distal end of the actuated output. The actuated output is configured to reciprocate the treatment structure at a frequency of between about 15 Hz and about 100 Hz, and at an amplitude of between about 0.15 and about 1.0 inches. The combination of amplitude and frequency provides

efficient reciprocation of the treatment structure such that the treatment structure provides therapeutically beneficial treatment to a targeted muscle of a user.

[0005] In a preferred embodiment, the actuated output is configured to reciprocate the treatment structure at a frequency of between about 25 Hz and about 48 Hz, and at an amplitude of between about 0.23 and about 0.70 inches. In another preferred embodiment, the actuated output is configured to reciprocate the treatment structure at a frequency of between about 33 Hz and about 42 Hz, and at an amplitude of between about 0.35 and about 0.65 inches.

[0006] In a preferred embodiment, the motor is configured to rotate a shaft having a shaft gear thereon about a shaft rotation axis. The housing includes a gear member disposed therein that is operatively engaged with the shaft gear and rotates about a gear rotation axis. The actuated output is operatively connected to the gear member, and the rotational motion of the shaft is converted to reciprocating motion of the actuated output through the engagement of the shaft gear and the gear member. Preferably, the gear rotation axis is perpendicular to the shaft rotation axis and an eccentric interface is disposed on the gear member at a location other than the gear rotation axis. Preferably, the device further includes a reciprocator shaft operatively connected to the eccentric interface, and a containment member. A head of the reciprocator shaft is contained by the containment member to restrict motion of the reciprocator shaft to a linear motion that is perpendicular to the gear rotation axis. In a preferred embodiment, the gear member comprises a counterweight disposed on the gear member, and the center of mass of the counterweight is not on the gear rotation axis. Preferably, the head of the reciprocator shaft includes an elongated opening therein, the eccentric interface includes a pin, and the pin is configured to move within the elongated opening as the gear member rotates.

[0007] In a preferred embodiment, the massage device includes a rotation housing. The main housing includes a rotation space defined therein. The rotation housing includes a main body portion disposed in the housing and an arm portion extending through the rotation space and outside the housing, wherein the actuated output extends outwardly from the arm portion, and the rotation housing can rotate within the rotation space between a plurality of positions. Preferably, the massage device includes a button extending outwardly from the housing that is movable between a first position and a second position. The button includes a plurality of teeth members. The housing includes a plurality of first teeth spaces defined therein and the rotation housing includes a plurality of second teeth spaces defined therein. When the button is in the first position the teeth members engage the first teeth spaces and the rotation housing cannot rotate. When the button is in the second position (when it is pressed in and overcomes the spring bias) the teeth members engage the second teeth spaces and the rotation housing can rotate.

[0008] In accordance with another aspect of the present invention, there is provided a reciprocating treatment device that includes a housing, a handle disposed on the housing, the handle having a handle axis, a motor disposed in the housing, and an actuated output operably connected to the motor. The actuated output is configured to reciprocate in response to activation of the motor. The reciprocation is along a reciprocation axis. The motor includes a shaft having a shaft rotation axis, and the shaft rotation axis lies in a plane defined by the handle axis and the reciprocation axis (they are all coplanar).

[0009] In a preferred embodiment, the reciprocating treatment device includes a gearbox to convert rotary motion from the shaft to reciprocal motion at the actuated output. Preferably, the gearbox includes a gear member having a gear rotation axis perpendicular to the shaft rotation axis, and an eccentric interface disposed on the gear at a location other than the gear rotation axis. The device also includes a reciprocator shaft operatively

connected to the eccentric interface, and a reciprocator interface configured to restrict linear motion of the reciprocator shaft to a direction parallel to the reciprocation axis and perpendicular to the gear rotation axis. The gear member preferably includes a counterweight disposed on the gear member. The center of mass of the counterweight is not on the gear rotation axis.

[0010] In a preferred embodiment, the counterweight has a mass similar to the components of the reciprocating treatment device that reciprocate along the reciprocation axis. Preferably, the counterweight has a mass between 45 grams and 55 grams. In a preferred embodiment, the gearbox is connected to a compliant dampening block and the compliant dampening block is connected to the housing. Preferably, the compliant dampening block comprises a polymer. In a preferred embodiment, the shaft is operably connected with the gearbox through a compliant shaft damper.

[0011] An embodiment provides a reciprocal treatment device. The reciprocal treatment device includes a housing, a motor connected to the housing, and an actuated output. The housing includes a handle located on the housing. The handle has a handle axis. The actuated output is operably connected to the motor. The actuated output is configured to reciprocate in response to activation of the motor. Reciprocation of the actuated output is along a reciprocation axis. The motor includes a shaft having a shaft rotation axis. The shaft rotation axis is parallel to a plane in which the handle axis and the reciprocation axis are located. Other embodiments of a reciprocal treatment device are also described.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The invention may be more readily understood by referring to the accompanying drawings in which:

- [0013] FIG. 1 depicts a cutaway side view of one embodiment of a reciprocating treatment device;
- [0014] FIG. 2 depicts a side view of one embodiment of the reciprocating treatment device of FIG. 1;
- [0015] FIGS. 3A and 3B depict perspective views of embodiments of actuation components of the reciprocating treatment device of FIG. 1;
- [0016] FIG. 4 depicts a side view of one embodiment of actuation components of the reciprocating treatment device of FIG. 1;
- [0017] FIG. 5 depicts a flowchart diagram showing one embodiment of a method of manufacture of the reciprocating treatment device of FIG. 1;
- [0018] FIG. 6 depicts a flowchart diagram showing one embodiment of a method of use of the reciprocating treatment device of FIG. 1;
- [0019] FIG. 7 is a side elevational view of a reciprocating treatment device in accordance with an embodiment of the present invention;
- [0020] FIG. 8 is a perspective view of the reciprocating treatment device of FIG. 7 with a portion of the housing removed to show the motor and actuation components;
- [0021] FIG. 9 is an exploded perspective view of a portion of the reciprocating treatment device of FIG. 7;
- [0022] FIG. 10 is a side elevational view of the motor and actuation components of the reciprocating treatment device of FIG. 7;
- [0023] FIG. 11A depicts the reciprocator shaft in the extended position;
- [0024] FIG. 11B depicts the reciprocator shaft between the extended and retracted positions;
- [0025] FIG. 11C depicts the reciprocator shaft in the retracted position;
- [0026] FIG. 11D depicts the reciprocator shaft between the extended and retracted positions;

- [0027] FIG. 11E depicts the reciprocator shaft in the extended position, but after being rotated relative to FIGS. 11A-11D;
- [0028] FIG. 12 is an exploded perspective view of the components associated with the rotation of the arm;
- [0029] FIG. 13 is a side elevational view with the rotation housing and actuated output rotated to a vertical position (compare to the horizontal position in FIG. 7);
- [0030] FIG. 14 is a perspective view of a reciprocating treatment device in accordance with an embodiment of the present invention;
- [0031] FIG. 15 is a side elevational view of the reciprocating treatment device of FIG. 14;
- [0032] FIG. 16 is a perspective view of a reciprocating treatment device in accordance with an embodiment of the present invention;
- [0033] FIG. 17 is a side elevational view of the reciprocating treatment device of FIG. 16;
- [0034] FIG. 18 is a perspective view of a reciprocating treatment device in accordance with an embodiment of the present invention;
- [0035] FIG. 19 is a side elevational view of the reciprocating treatment device of FIG. 18;
- [0036] FIG. 20 is a perspective view of the gearbox assembly;
- [0037] FIG. 21 is a perspective view of the pinion coupling assembly;
- [0038] FIG. 22 is an exploded perspective view of the pinion coupling assembly;
- [0039] FIG. 23 is a perspective view of some of the drive components;
- [0040] FIG. 24 is a perspective view of the pushrod or actuated output with an adapter assembly;
- [0041] FIG. 25 is a cross-sectional view of a portion of the adapter assembly;
- [0042] FIG. 26 is a side elevational view of the adapter assembly; and
- [0043] FIG. 27 is an exploded perspective view of a portion of the adapter assembly.
- [0044] Like numerals refer to like parts throughout the several views of the drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0045] The following description and drawings are illustrative and are not to be construed as limiting. Numerous specific details are described to provide a thorough understanding of the disclosure. However, in certain instances, well-known or conventional details are not described in order to avoid obscuring the description. References to one or another embodiment in the present disclosure can be, but not necessarily are, references to the same embodiment; and, such references mean at least one of the embodiments.

[0046] Reference in this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the disclosure. Appearances of the phrase "in one embodiment" in various places in the specification do not necessarily refer to the same embodiment, nor are separate or alternative embodiments mutually exclusive of other embodiments. Moreover, various features are described which may be exhibited by some embodiments and not by others. Similarly, various requirements are described which may be requirements for some embodiments but not other embodiments.

[0047] The terms used in this specification generally have their ordinary meanings in the art, within the context of the disclosure, and in the specific context where each term is used. Certain terms that are used to describe the disclosure are discussed below, or elsewhere in the specification, to provide additional guidance to the practitioner regarding the description of the disclosure. For convenience, certain terms may be highlighted, for example using italics and/or quotation marks: The use of highlighting has no influence on the scope and meaning of a term; the scope and meaning of a term is the same, in the same context, whether or not it is highlighted. It will be appreciated that the same thing can be said in more than one way.

[0048] Consequently, alternative language and synonyms may be used for any one or more of the terms discussed herein. Nor is any special significance to be placed upon whether or

not a term is elaborated or discussed herein. Synonyms for certain terms are provided. A recital of one or more synonyms does not exclude the use of other synonyms. The use of examples anywhere in this specification including examples of any terms discussed herein is illustrative only, and is not intended to further limit the scope and meaning of the disclosure or of any exemplified term. Likewise, the disclosure is not limited to various embodiments given in this specification.

[0049] Without intent to further limit the scope of the disclosure, examples of instruments, apparatus, methods and their related results according to the embodiments of the present disclosure are given below. Note that titles or subtitles may be used in the examples for convenience of a reader, which in no way should limit the scope of the disclosure. Unless otherwise defined, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this disclosure pertains. In the case of conflict, the present document, including definitions, will control.

[0050] It will be appreciated that terms such as "front," "back," "top," "bottom," "side," "short," "long," "up," "down," and "below" used herein are merely for ease of description and refer to the orientation of the components as shown in the figures. It should be understood that any orientation of the components described herein is within the scope of the present invention.

[0051] While many embodiments are described herein, at least some of the described embodiments provide an apparatus, system, and method for a reciprocating treatment device.

[0052] FIGS. 1-12 show embodiments of a reciprocating treatment device 100. FIGS. 1-4 show the device in schematic form and FIGS. 7-12 show the device 100 in more detail.

[0053] FIG. 1 depicts a cutaway side view of one embodiment of a reciprocating treatment device 100. Reference is also made to FIGS. 7-8. The reciprocating treatment device 100

includes a housing 101, a power input 102, a switch 104, a motor 106, and an actuated output 108. The reciprocating treatment device 100, in some embodiments, generates motion at the actuated output 108 for treating a patient.

[0054] The housing 101, in one embodiment, is a structure allowing for connection of one or more other components of the reciprocating treatment device 100. The housing 101 may completely or substantially enclose one or more other components. For example, the housing 101 may be a formed structure with attachment points for other components that substantially encloses one or more of those components when assembled. In another embodiment, the housing 101 may allow other components to be exposed. For example, the housing 101 may be an open frame. In some embodiments, the housing 101 encloses one or more components of the reciprocating treatment device 101 and leaves one or more other components of the reciprocating treatment device 101 exposed.

[0055] As shown in FIGS. 1, 6 and 7, the housing 101 includes a handle 120. The handle 120 defines a handle axis 122 that runs substantially along the longest dimension of the handle 120. In some embodiments, the handle 120 is straight or substantially straight along its longest dimension, and the handle axis 122 runs through the center or substantially through the center of the handle 120. In another embodiment, the handle 120 is curved along its longest dimension, and the handle axis 122 is tangent to the curvature of the handle 120 at the midpoint of the handle 120. In a preferred embodiment, the handle 120 has a top surface 120a that is shaped that it can be ergonomically gripped by a person's palm. This provides comfort for a user when operating the device. See, for example, U.S. Patent No. 6,105,891, the entirety of which is incorporated herein by reference, which teaches a fishing reel knob that includes a similar shape that conforms to the user's palm.

[0056] The power input 102, in some embodiments, is configured to receive a power input from a power source 114. The power source 114 may be any type of power source capable

of supplying power to the motor 106. In one embodiment, the power input 102 receives an electrical input from the power source 114. For example, the power source 114 may be a battery that provides electrical current. In one embodiment, the battery is a rechargeable battery. In some embodiments, the battery is attachable to the reciprocating treatment device 100 such that the reciprocating treatment device 100 including the power source 114 is portable and cordless. In an alternative embodiment, the reciprocating treatment device 100 uses an external battery pack as a power source 114.

[0057] The battery may be any type of battery known in the art. For example, the battery may include a rechargeable lithium-ion (LiIon) based battery. In another example, the battery may include a rechargeable nickel metal hydride (NiMH) battery. In yet another example, the battery may include a rechargeable lithium-polymer (LiPo) battery. In some embodiments, the battery includes a nickel-cadmium (NiCad) battery. In one embodiment, the battery uses a non-rechargeable battery.

[0058] In an alternative embodiment, the power input 102 includes a cord to receive power from an electrical grid. For example, the reciprocating treatment device 100 may include a cord with a plug configured to interface with a wall socket to provide power.

[0059] In another alternative embodiment, the power input 102 is non-electrical. For example, the power input 102 may receive pressurized air from a pressure vessel or a network of pressurized air. In another embodiment, the power input 102 may include one or more reactive materials to provide energy for operation of the reciprocating treatment device 100.

[0060] The switch 104, in some embodiments, controls delivery of power to the motor 106. The switch 104 may be an electrical switch configured to allow passage of electric current when activated. In some embodiments, the switch 104 is a binary on/off switch. In another embodiment, the switch 104 is a variable switch. A variable switch controls the amount of

power delivered to the motor 106. A relatively high amount of power delivered to the motor 106 by the variable switch 104 results in an increased speed of the motor 106. A relatively low amount of power delivered to the motor 106 by the variable switch 104 results in a decreased speed of the motor 106. In one embodiment, the variable switch 104 includes a variable resistor that allows a progressively increased amount of power to flow to the motor 106 in response to a progressively increasing activation of that switch 104.

[0061] In some embodiments, the switch 104 may remain in an activated position in response to a user releasing the switch 104. In an alternate embodiment, the switch 104 may return to a deactivated position in response to a user releasing the switch 104. For example, the switch 104 may include a biasing member such as a spring configured to push the switch 104 to the deactivated position in response to the switch 104 being released.

[0062] In certain embodiments, the switch 104 includes multiple positions. For example, the switch 104 may include an off position, a first activated position, and a second activated position. The switch 104 may include one or more positions in which without additional user input, the switch 104 remains in that position, and one or more positions in which without additional user input, the switch 104 is biased to exit that position.

[0063] For example, the switch 104 may have an “off” position, an “on” position, and a “turbo” position. The “on” and “turbo” positions may activate reciprocation at different rates, such as 2300 cycles per minute in the “on” position and 2800 cycles per minute in the “turbo” position. Upon being set to the “on” position, the switch 104 may remain in the “on” position without requiring the user to maintain contact with the switch 104. Upon being set to the “turbo” position, the switch 104 may be biased to return to the “on” position unless the user maintains a force on the switch 104 that opposes a return to the “on” position.

[0064] The motor 106, in one embodiment, converts power from the power source 102 into motion. In some embodiments, the motor 106 is an electric motor. The electric motor may be any type of electric motor known in the art, including, but not limited to, a brushed motor, a brushless motor, a direct current (DC) motor, an alternating current (AC) motor, a mechanical-commutator motor, an electronic commutator motor, or an externally commutated motor.

[0065] In some embodiments, the motor 106 operates at a speed that can be varied by different levels of activation of the switch 104. For example, the motor 106 may operate at a maximum rate in response to a maximum activation of the switch 104. The motor 106 may operate at a lower rate in response to a less than maximum activation of the switch 104.

[0066] The motor 106 may produce rotary motion. The rotary motion delivered by the motor 106 may be delivered through a shaft 116. The shaft 116 may rotate around a shaft axis 126. In some embodiments, the reciprocating treatment device 100 may include a linkage to convert the rotary motion of the motor 106 into reciprocating motion. An embodiment of a linkage is shown in greater detail in relation to FIGS. 3A, 3B and 8-10 below.

[0067] In an alternative embodiment, the motor 106 may produce reciprocating motion. For example, the motor 106 may include a reciprocating pneumatic cylinder that reciprocates in response to an input of compressed air.

[0068] The actuated output 108, in some embodiments, reciprocates in response to an input from the motor 106. For example, the motor 106 may produce rotary motion. A gearbox may be connected to the motor 106 to convert the rotary motion to reciprocating motion. The gearbox may be connected to the actuated output 108. An embodiment of the gearbox is shown in greater detail in relation to FIGS. 4 and 8-10 below.

[0069] In some embodiments, the actuated output 108 reciprocates at a rate of approximately 65 Hz. The actuated output 108, in some embodiments, reciprocates at a rate over 50 Hz. The reciprocating treatment device 100, in some embodiments, provides reciprocation at a rate ranging between 50 Hz and 80 Hz. In some embodiments, the actuated output 108 has a maximum articulation rate of between 50 Hz and 80 Hz. In another embodiment, the actuated output 108 has an articulation rate of between 30 Hz and 80 Hz. In certain embodiments, the actuated output 108 has an articulation rate of approximately 37 Hz. In one embodiment, the actuated output 108 has an articulation rate of approximately 60 Hz. In a preferred embodiment, the actuated output 108 articulates or reciprocates at a frequency of between about 15 Hz and about 100 Hz. In a more preferred embodiment, the actuated output 108 articulates or reciprocates at a frequency of between about 25 Hz and about 48 Hz. In the most preferred embodiment, the actuated output 108 articulates or reciprocates at a frequency of between about 33 Hz and about 42 Hz. Any chosen range within the specified ranges is within the scope of the present invention.

[0070] The actuated output 108 may move through a predetermined range of reciprocation. For example, the actuated output 108 may be configured to have an amplitude of one half inch. In another embodiment, the actuated output 108 may be configured to have an amplitude of one quarter inch. As will be appreciated by one skilled in the art, the actuated output 108 may be configured to have any amplitude deemed therapeutically beneficial.

[0071] In some embodiments, the actuated output 108 may be adjustable through a variable range of reciprocation. For example, the reciprocating treatment device 100 may include an input to adjust the reciprocation amplitude from one quarter of an inch through a range of up to one inch. In a preferred embodiment, the actuated output 108 moves through an amplitude of between about 0.15 inches and about 1.0 inches. In a more preferred embodiment, the actuated output 108 articulates or reciprocates at a frequency of between

about 0.23 inches and about 0.70 inches. In the most preferred embodiment, the actuated output 108 articulates or reciprocates at a frequency of between about 0.35 inches and about 0.65 inches. Any chosen range within the specified ranges is within the scope of the present invention.

[0072] It will be appreciated that the device operates most effectively within the combined frequency and amplitude ranges. When developing the invention, the inventor determined that if the frequency and amplitude are above the ranges set forth above the device can cause pain and below the ranges the device is ineffective and does not provide effective therapeutic relief or massage. Only when the device operates within the disclosed combination of frequency and amplitude ranges does it provide efficient and therapeutically beneficial treatment to the muscles targeted by the device.

[0073] In certain embodiments, the reciprocating treatment device 100 includes one or more components to regulate the articulation rate of the actuated output 108 in response to varying levels of power provided at the power input 102. For example, the reciprocating treatment device 100 may include a voltage regulator (not shown) to provide a substantially constant voltage to the motor 106 over a range of input voltages. In another embodiment, the current provided to the motor 106 may be regulated. In some embodiments, operation of the reciprocating treatment device 100 may be restricted in response to an input voltage being below a preset value.

[0074] In some embodiments, the actuated output 108 includes a connector 110 for connection of an attachment. In some embodiments, the actuated output 108 includes a securing mechanism 112 for securing an attachment in the connection socket 110. The connector 110 may be any type of structure capable of retaining an attachment, such as a socket with a latch, a threaded connector, or the like.

[0075] For example, the securing mechanism 112 may include a biased structure, such as a spring, to bias the securing mechanism 112 toward a locked position. In the locked position, the securing mechanism 112 may restrict removal of an attachment. The biased structure may be articulated by a user to move the securing mechanism 112 toward an unlocked position. In the unlocked position, the securing mechanism 112 may allow removal of an attachment.

[0076] In some embodiments, the securing mechanism 112 includes a keyway to interact with a key on an attachment. The keyway may be selectively opened and closed by articulation of the securing mechanism 112. Removal of an attachment may be restricted in response to the keyway being closed.

[0077] As shown in FIG. 9, in another embodiment, the connector 110 can be a male connector and can include at least one (and preferably two) outwardly biased ball bearings 110a that mate with the treatment structure 204.

[0078] In certain embodiments, the actuated output 108 reciprocates along a linear or substantially linear path. The path traveled by the actuated output 108 defines a reciprocation axis 124. In certain embodiments, the reciprocation axis 124 runs through the geometric center of one or more components of the actuated output 108.

[0079] The actuated output 108, in some embodiments, includes a safety extension 128 between a portion of the housing 101 and a protruding portion, such as the connection mechanism 112. The safety extension 128 provides a region of the actuated output 108 with a substantially constant cross-sectional profile. The safety extension 128 reduces the risk of pinching a body part, such as a finger, as the actuated output 108 actuates. The safety extension 128 may be defined as the region of the actuated output 108 between any non-reciprocating component, such as the housing 101, and any component of the actuated output 108 that has a relatively large or extending cross section, such as the connection

mechanism. In one embodiment, the length of the safety extension 128 along the reciprocation axis 124, when measured when the actuated output 108 is fully retracted, is larger than the width of any of an average user's fingers. In some embodiments, the length of the safety extension 128 along the reciprocation axis 124, when measured when the actuated output 108 is fully retracted, is at least 18 millimeters.

[0080] In some embodiments, the motor 106 is connected to the housing 101 such that the shaft rotation axis 126 is parallel to a plane defined by the handle axis 122 and the reciprocation axis 124. In one embodiment, the motor 106 is connected to the housing 101 such that the shaft rotation axis 126 is coplanar with a plane defined by the handle axis 122 and the reciprocation axis 124.

[0081] FIG. 2 depicts a side view of one embodiment of the reciprocating treatment device 100 of FIG. 1. The reciprocating treatment device 100 includes an attachment 202, a treatment structure 204, and a rest surface 206. The reciprocating treatment device 100, in one embodiment, generates reciprocating motion at the treatment structure 204 for treating a patient.

[0082] The attachment 202 may be an interchangeable, user selectable component that is connectable to the actuated output 108. The attachment 202 may include a treatment structure 204 designed to interact with a patient.

[0083] The rest surface 206 is a surface disposed on the housing 101. The rest surface 206 is configured such that when the reciprocating treatment device 100 has the rest surface 206 placed on a flat, horizontal surface, the reciprocating treatment device 100 is capable of resting in that position without application of an external force. In other words, when resting as described above, a line drawn downward from a center of gravity of the reciprocating treatment device 100 passes through the rest surface 206. As used in this

paragraph, “downward” refers to a direction in which gravity applies a force to objects having mass.

[0084] FIGS. 3A, 3B and 8-11E depict views of embodiments of the actuation components 300 for the reciprocating treatment device 100. The actuation components 300 generally include the motor 106, a compliant shaft damper 302, a shaft 116 with a shaft gear 117 thereon, a gear member 304, an eccentric interface 306, a reciprocator interface 308, a reciprocator shaft 310, and an actuated output 108. The motor 106, the shaft 116, and the actuated output 108 are similar to like-numbered components described above in relation to FIG. 1. The actuation components 300 create motion that is delivered at the actuated output 108.

[0085] In one embodiment, rotary motion is delivered from the motor 106 via the shaft 116 and gear 107. In certain embodiments, the motor 106 is connected to other components of the actuation components 300 by a compliant shaft damper 302. The compliant shaft damper 302 comprises a compliant material configured to absorb vibration generated by the actuation components 300. The compliant shaft damper 302 may transmit rotary motion generated by the motor 106 while deforming under vibration loads, thus absorbing or partially absorbing and reducing vibration in the reciprocating treatment device 100.

[0086] The compliant shaft damper 302 may include any material capable of absorbing vibration. In some embodiments, the compliant shaft damper 302 includes a polymer. For example, the compliant shaft damper 302 may include a flexible polymer. In one example, the compliant shaft damper 302 includes polyurethane foam, thermoplastic elastomer (“TPE”), including but not limited to Styrenic block copolymers (TPE-s), Polyolefin blends (TPE-o), Elastomeric alloys (TPE-v or TPV), Thermoplastic polyurethanes (TPU), Thermoplastic copolyester, or Thermoplastic polyamide. In another example, the

compliant shaft damper 302 may include polyvinyl chloride (PVC), low durometer PVC, or a urethane.

[0087] The gear member 304, in one embodiment, receives rotary motion generated by the motor 106. In some embodiments, the gear member 304 rotates in response to rotation of the motor 106. In one embodiment, the gear member 304 rotates around a rotation axis 316 that is perpendicular to a shaft rotation axis 126. For example, the gear member 304 may be part of a bevel gear, a spiral bevel gear, or a hypoid gear. Such gears may have the effect of rotating an axis of rotation by 90 degrees.

[0088] In some embodiments, the gear member 304 includes an eccentric interface 306. The eccentric interface 306 is disposed on a surface of the gear member 304 such that it or its center is at a location not on the gear rotation axis 316. In other words, if the gear member 304 is round, the eccentric interface 306 is not disposed at the center of the gear member 304.

[0089] In response to rotation of the gear member 304 and subsequent motion of the eccentric interface 306, the reciprocator interface 308 restricts linear motion of the eccentric interface 306 relative to the reciprocator interface 308 to a direction perpendicular to both the reciprocation axis 124 and the gear rotation axis 316. In other words, the eccentric interface 306 is free to slide side-to-side within the reciprocator interface 308 as the gear member 304 rotates. Note that in addition to sliding relative to the reciprocator interface 308, the eccentric interface 306 may rotate.

[0090] As shown in FIG. 9, in a preferred embodiment, the eccentric interface 306 includes a pin 22 and sleeve 24. The pin 22 is received in an off-center opening 26 defined in or through the gear member 304. The sleeve 24 is received in an elongated opening 34 that is defined in an end or head 36 of the reciprocator shaft 310.

[0091] The eccentric interface 306, in one embodiment, interfaces with a reciprocator interface or containment member 308. The containment member 308 contains the head 36 of the reciprocator shaft 310 and defines a reciprocation space 38 in which the head 36 of the reciprocator shaft 310 and the eccentric interface components 306 can reciprocate. The containment member 308 includes legs 40 that each include an interior surface that defines a step 42 therein. The larger dimension between the legs defines a space for the head 36 to reciprocate and the smaller dimension between the legs defines a space for the sleeve to reciprocate. In a preferred embodiment, the reciprocator shaft 310 is L-shaped or includes an arm portion so that it connects to the actuated output or shaft 108 along the reciprocation axis.

[0092] In some embodiments, the effect of the interaction between the eccentric interface 306 and the reciprocator interface 308 is to convert rotary motion at the gear member 304 to reciprocating, linear motion at the reciprocator shaft 310. The reciprocator shaft 310 transmits reciprocating, linear motion to the actuated output 108.

[0093] As shown in FIGS. 3B and 9, in one embodiment, the gear member 304 includes a counterweight 312. The counterweight 312 is configured to oppose inertial forces generated by the reciprocating motion of the actuated output 108. The counterweight 312 may be positioned on the gear member 304 such that its center of mass 314 is not located along the gear rotation axis 316. In certain embodiments, a first direction from the gear rotation axis 316 to the center of mass 314 of the counterweight 312 may be the opposite direction from a second direction from the gear rotation axis 316 to the center of the eccentric interface 306. Preferably, the counterweight 312 is located on one side of the gear member 304 and the gear teeth are located on the opposite side. In another embodiment, the gear and counterweight can be separate parts.

[0094] In some embodiments, as the reciprocating treatment device 100 operates, the counterweight 312 applies at least a component of force in the opposite direction to a reaction force applied to the eccentric interface 306 by the reciprocator interface 308. In other words, the counterweight 312 may serve to counteract an inertial force generated by reciprocating components and reduce vibration caused by reciprocal motion of the actuated output 108.

[0095] In some embodiments, the counterweight 312 may be sized to match reciprocating components of the reciprocating treatment device 100. For example, the counterweight 312 may have a mass similar to reciprocating components, including, for example, the reciprocator shaft 310, the actuated output 108, and an attachment 202. In another embodiment, the counterweight has a mass between 45 grams and 55 grams.

[0096] FIG. 11A shows the reciprocator shaft 310 in the extended position and FIG. 11C shows the reciprocator shaft 310 in the retracted position. FIGS. 11B and 11D show the reciprocator shaft in between the retracted and extended positions. Note how the pin 22 and sleeve 24 (eccentric interface) move within elongated opening 34 and the containment member 308 keeps the head 36 of the reciprocator shaft 310 moving linearly. FIG. 11E shows the reciprocator shaft 310 in the extended position, but after the rotation assembly 47 has been rotated, as discussed below.

[0097] As shown in FIGS. 8-10, the actuation components 300 include a guide member 30 that includes a central opening through which the reciprocator shaft 310 extends. The guide member 30 is housed in the rotation housing 44 and remains stationary as the reciprocator shaft moves therein. In a preferred embodiment, the actuation components 300 also include a pin or axle 16 on which the gear member 304 rotates a bearing 14 and a dampening ring 28 for damping the connection between the housing and the metal components.

- [0098] FIGS. 4 and 8-11E depict embodiments of actuation components 300 of the reciprocating treatment device 100. The actuation components include the motor 106, the gear member 304, the reciprocator shaft 310, one or more compliant dampening blocks 402 and, a gearbox 404. The actuation components 300 provide reciprocating motion through the reciprocator shaft 310 and manage vibration transmitted to the housing 101.
- [0099] The one or more compliant dampening blocks 402 manage vibration conducted from the actuation components 300 to the housing 101. The one or more compliant dampening blocks 402 may be disposed between the actuation components 300 and the housing 101.
- [00100] The one or more compliant dampening blocks 402 may include any material capable of absorbing vibration. In some embodiments, the one or more compliant dampening blocks 402 include a polymer. For example, the one or more compliant dampening blocks 402 may include a flexible polymer. In one example, the one or more compliant dampening blocks 402 include polyurethane foam, thermoplastic elastomer (“TPE”), including but not limited to Styrenic block copolymers (TPE-s), Polyolefin blends (TPE-o), Elastomeric alloys (TPE-v or TPV), Thermoplastic polyurethanes (TPU), Thermoplastic copolyester, or Thermoplastic polyamide. In another example, the one or more compliant dampening blocks 402 may include polyvinyl chloride (PVC), low durometer PVC, or a urethane.
- [00101] The gearbox 404, in one embodiment, includes the gear member 304 and the reciprocator 310. The gearbox 404 may provide mounting points for the gear member 304 and the reciprocator 310. The gearbox 404 may restrict the motion of the gear member 304 and the reciprocator to certain directions or rotational axes. The gearbox 404 may be mounted to the housing 101. In some embodiments, the gearbox 404 is separated from the housing 101 by the one or more compliant dampening blocks 402.

[00102] As is shown in FIGS. 11C and 12, in some embodiments, the actuated output 108 and associated components is rotatable relative to the housing 101. The actuated output 108 may rotate relative to the housing 101 around an output rotation axis. In certain embodiments, the output rotation axis is parallel to the gear rotation axis 316. In one embodiment, the output rotation axis is concomitant with the gear rotation axis 316. For example, the actuated output 108, the reciprocator 310, and the reciprocator interface 308 may be selectively rotatable around the gear rotation axis 316.

[00103] In one embodiment, rotation of the actuated output 108 may be selectively locked and unlocked by a user. For example, the user may unlock rotation of the actuated output 108, rotate the actuated output 108 to a desired position relative to the housing 101, lock rotation of the actuated output 108, and operate the reciprocating treatment device 100.

[00104] As shown in FIG. 12 in a preferred embodiment, the rotation assembly 47 includes the rotation housing 44 (which includes first and second rotation housing halves 44a and 44b), a button 46 having teeth 48 thereon and a spring 18. The gear member 304, reciprocator shaft 310, axle 16, a portion of the gear box 404, and bearing 14 are all housed in the rotation housing 44. The assembly also includes a gear box cover 56 and dampening ring 52. Button 46 is outwardly biased by spring 18 to a position where teeth 48 are engaged with teeth 50 defined in housing 101. The button 46 is movable between a first position where teeth 48 are engaged with teeth 50 and a second position where teeth 48 are engaged with teeth 54 in the second rotation housing half 44b. When the button 46 is in the first position, the rotation assembly 47 cannot rotate. When the button is pushed to the second position, the teeth 48 disengage from teeth 50 and engage the teeth 54 in the rotation housing 44, thereby allowing the entire rotation assembly 47 to rotate. The rotation housing 44 includes a main body portion 62 disposed in the housing and an arm portion 64 extending through the rotation space 60 and outside the housing. The arm portion 64

rotates within the rotation space 60 defined in the housing 101. It will be appreciated, that when rotation occurs, gear member 304 and gear box 404 do not rotate (compare FIGS. 11A-11D to FIG. 11E), but the containment member 308 together with the actuated output 108 do rotate.

[00105] FIG. 5 depicts a flowchart diagram showing one embodiment of a method of manufacture of the reciprocating treatment device of FIG. 1.

[00106] FIGS. 5 and 6 are flowchart diagrams depicting embodiments of a method 500 for manufacturing the reciprocating treatment device 100 of FIG. 1 and a method 600 of use of the reciprocating treatment device 100 of FIG. 1. The methods 500, 600 are, in certain embodiments, methods of use of the system and apparatus described herein, and will be discussed with reference to those figures. Nevertheless, the methods 500, 600 may also be conducted independently thereof and are not intended to be limited specifically to the specific embodiments discussed above with respect to those figures.

[00107] As shown in FIG. 5, a method of manufacture 500 for a reciprocating treatment device 100 is shown. In one embodiment of the method of manufacture 500, a housing 101 is provided 502. The housing 101 may include a handle 120 and the handle 120 may define a handle axis 122. A motor 106 is connected 504 to the housing 101. The motor 106 may provide rotary motion.

[00108] In some embodiments, an actuated output 108 is operably connected 506 to the motor 106. The actuated output 108 may reciprocate in response to activation of the motor 106. Reciprocation of the actuated output 108 may be along a reciprocation axis 124.

[00109] In some embodiments, the motor 106 includes a shaft 116. The shaft 116 may rotate around a shaft rotation axis 126. The shaft rotation axis 126 may be parallel to a plane in which the handle axis 122 and the reciprocation axis 124 are located.

[00110] As shown in FIG. 6, a method of use 600 for a reciprocating treatment device 100 is shown. In one embodiment of the method of use 600, a force is applied 602 to a body part by an actuated output 108 of the reciprocal treatment device 100. The reciprocal treatment device 100 may include a housing 101. The housing 101 may include a handle 120 disposed on the housing 101. The handle 120 may define a handle axis 122.

[00111] The reciprocal treatment device 100 may also include a motor 106 connected to the housing 101. An actuated output 108 may be operably connected to the motor 106. The actuated output 108 may be configured to reciprocate in response to activation of the motor 106. Reciprocation of the actuated output 108 may be along a reciprocation axis 124.

[00112] The motor 106 may include a shaft 116 having a shaft rotation axis 126. The shaft rotation axis 126 may be parallel to a plane in which the handle axis 122 and the reciprocation axis 124 are located.

[00113] FIGS. 14-27 show further embodiments of the present invention. Many of the components of the reciprocal treatment devices of FIGS. 14-27 are the same or similar those discussed above with respect to reciprocal treatment device 100. Accordingly, the description hereinafter focuses on components that are different. FIGS. 14-15 show an embodiment of a reciprocal treatment device 208 (referred to as the G3) that includes a rechargeable battery that is not removable, and comes with four different treatment structures, a charger for the battery, a port for plugging the device in to charge the battery, and a case for the treatment structures. In another embodiment, the G3 can include a removable battery. The head of the device 208 is not rotatable. FIGS. 16-17 show an embodiment of another reciprocal treatment device 210 (referred to as the G3 consumer model) that includes a rechargeable battery that is not removable, but includes a port for plugging the device in to charge the battery. The device 210 comes with two different treatment structures and a cord for charging the battery. In a preferred embodiment, the

treatment structures are not interchangeable with those of device 208. The head of the device 210 is not rotatable. FIGS. 18-19 show an embodiment of a reciprocal treatment device 212 (referred to herein as the G3PRO) that includes a rechargeable battery (and replaceable or removable battery), and comes with seven different treatment structures, a charger for the battery, a port for plugging the device in to charge the battery and a case for the device and treatment structures. The head of the device 212 is rotatable. Device 212 also includes multiple speed settings (preferably 1500 and 2400 RPM, but can be any speed or frequency taught herein). Furthermore, those of ordinary skill in the art will appreciate that although the RPM is listed as a specific number that, due to manufacturing tolerances, the RPM may oscillate. For example, at the 2400 RPM setting the RPM may actually oscillate between 2260 and 2640.

[00114] FIGS. 20-27 show some of the interior components that are included in the treatment devices 208, 210 and 212 shown in FIGS. 14-19. As shown in FIG. 20, the gearbox housing 404 includes a clearance slot 214 defined therein for the connecting rod. The slot is so the shaft can move freely and allow the arm to articulate. As shown in FIGS. 20-22, the device includes a pinion coupling assembly 216 that is disposed between the motor and the pinion or shaft gear 117. The pinion coupling assembly 216 is used to couple the motor to the gearbox so that the torque is fully transmitted, such that there is no radial movement and the vibrations and noise are minimized. The pinion coupling assembly 216 preferably includes three separate components, a lower connector 218, a cross coupling 220 and an upper connector 222. These components work together to reduce noise and vibration. In a preferred embodiment, the lower and upper connectors are made of plastic and the cross coupling is made of an elastomer. In a preferred embodiment, the cross coupling 220 is made of rubber that includes a hardness where vibrations generated by the motor are isolated while keeping the strength and transmitting the torque efficiently (without

significant energy dissipation). However, the materials are not a limitation on the present invention.

[00115] As shown in FIG. 23, in a preferred embodiment, to prevent the gearbox from transmitting vibrations to the housing a rubber cover is provided. Further inner suspension rings isolate vibration of the gearbox from handle and the treatment structures. Preferably, the rings are made of an elastomer.

[00116] As shown in FIGS. 24-27, in a preferred embodiment, the pushrod assembly or actuated output 108 includes two halves with an adapter member 226 therebetween to also help reduce noise and vibration. The adapter member 226 isolates the vibrations generated in the gearbox and prevents them from being transmitted down the shaft to the treatment structure. The adapter member 226 includes anti-rotation tabs 228 to protect the push rod from user applied torque during use. The first half 230 of the actuated output 108 includes an opening 232 on an end thereof that receives a pin 234. The connection between the first half 230 and the adapter member 226 includes a bushing with the pin and elastomeric material to dampen vibrations. the second half 236 of the push rod or actuated output 108 is received in an opening 238 in the adapter member.

[00117] FIGS. 28-38 show another embodiment of a percussive massage device 400 (sometimes referred to as the G4) . Many of the components and characteristics of the reciprocal treatment devices of FIGS. 1-27 are the same or similar those discussed above with respect to reciprocal treatment device 100 and 208. Accordingly, the description hereinafter focuses on components that are different. In a preferred embodiment, the percussive massage device 400 includes a brushless motor 402 that is located where the gearbox was located in percussive massage device 208, as shown in FIG. 28. The brushless motor does not include any gears and is quieter than geared motors.

[00118] The device includes a push rod or shaft 404 that is connected directly to the motor 402 by a pin 406. In a preferred embodiment, the push rod 404 is L-shaped or includes an arc shape, as shown in FIGS. 28-31. Preferably, the point where the push rod 404 is connected to the pin 406 is offset from reciprocating path that the distal end 408 of the push rod 404 (and the massage attachment) travel. This capability is provided by the arc or L-shape. It should be appreciated that the push rod 404 is designed such that it can transmit the force diagonally instead of vertically so the motor can be located at or near the middle of the device, otherwise a protrusion would be necessary to keep the shaft in the center with the motor offset therefrom (and positioned in the protrusion). The arc also allows the push rod 404 to have a close clearance with the motor, as shown in FIG. 31, and allows the outer housing to be smaller than similar prior art devices, therefore making the device 400 lower profile. Preferably two bearings 410 (see FIGS. 32 and 37) are included at the proximal end of the push rod where it connects to the motor to counteract the diagonal forces and preventing the push rod from moving and touching the motor.

[00119] In a preferred embodiment, the device will include a touch screen 409 for stopping, starting, activating, etc. The touch screen can also include other functions. Preferably, the device will include a thumbwheel or rolling button positioned near the touch screen/on off button to allow the user to scroll or navigate through the different functions.

[00120] As shown in FIGS. 33-35, the G4 preferably includes a button or trigger 412 for allowing the rotation housing or head to rotate or articulate. The button 412 is spring biased (by spring 413) to the non-articulating position and includes a key 422 that can be received in a plurality of notches 424 defined in the housing that surrounds the motor. The key 422 is operationally attached to the trigger 412 via a trigger pin 415. To articulate or rotate the head, the button is moved away from the motor, which moves the key 422 out of

the notch 424 in which it is positioned (to the articulating position), the head is rotated and the button is released so that the key 422 is received in a different notch 424.

[00121] As shown in FIG. 36, in a preferred embodiment, a cable tension assembly 414 is associated with the rotation capability. The motor 402 includes wires or cables 416. When the head is rotated the cables 416 move and can get in the way of other components. Therefore, the cable tensioning assembly 414 provides tension on the cables across the full range of motion or rotation of the head. As shown in FIG. 36, the cable tensioning assembly 414 preferably includes a reel 418 that the cables 416 wrap around and a spring or other biasing mechanism 420 that provides tension on the cables as the head is rotated. The reel 418 is preferably positioned on a slider and moves toward the motor or away from the motor to keep tension on the cables.

[00122] In a preferred embodiment, the device includes a number of dampening components that are made of an elastomer or the like and damp vibrations to keep the device relatively quiet. For example, as shown in FIG. 37, the device includes dampening rings 426 that surround the rotation housing and help dampen the sound of vibration between the rotation housing and outer housing. The dampening ring can also be seen in FIG. 38. Preferably the device can be wirelessly charged. Preferably, the device also includes variable amplitude or stroke. For example, the stroke can change or be changed between about 8-16 mm.

[00123] In a preferred embodiment, the device 400 is associated with and can be operated by an app or software that runs on a mobile device such as a phone, watch or tablet (or any computer). The app can connect to the device 400 via bluetooth or other connection protocol. The app can have any or all of the following functions. Furthermore, any of the functions discussed herein can be added to the touch screen/scroll wheel capability directly on the device. If the user walks or is located too far away from the device, the device will not work or activate. The device can be turned on an off using the app as well as the touch

screen or button on the device. The app can control the variable speeds (e.g., anywhere between 1750-3000 RPM). A timer so the device stops after a predetermined period of time. The app can also include different treatment protocols associated therewith. This will allow the user to choose a protocol or area of the body they want to work on. When the start of the protocol is selected, the device will run through a routine. For example, the device may run at a first RPM for a first period of time and then run at a second RPM for a second period of time. The routines can also include prompts for letting the user to know to move to a new body part. These routines or treatments can be related to recovery, blood flow increase, performance, etc. and can each include a preprogrammed routine. The routines can also prompt or instruct the user to switch treatment structures (AmpBITS) or positions of the arm or rotation head. The prompts can include sounds, haptic feedback (e.g., vibration of the device or mobile device), textual instructions on the app or touch screen, etc. For example, the app may instruct the user to start with the ball treatment structure with the arm in position two. Then the user hits start and the device runs at a first frequency for a predetermined amount of time. The app or device then prompts the user to begin the next step in the routine and instructs the user to change to the cone treatment structure and to place the arm in position 1. The user hits start again and the device runs at a second frequency for a predetermined amount of time.

[00124] The device can also include a torque or force meter to let the user know how much force they are applying. Will show how much force is being applied on the muscle. It will allow for a more precise and effective treatment. The device includes a torque measuring sensor and display. Depending on the muscle the device is being used on and the benefit the user is looking to get (prepare, perform, recover) the force that should be applied varies. By having a torque sensor, the user will be able to get a more precise and personalized treatment. The app and the touchscreen can provide the force information to

the user. The force meter can be integrated with the routines and the user can be provided feedback with whether they are applying too much or too little pressure. The device can also include a thermal sensor or thermometer that can determine the temperature of the user's muscle and to provide feedback to the device and/or app. The haptic feedback can also provide feedback for too much pressure or force.

[00125] FIGS. 39-42 show another embodiment of a percussive massage device 500 that is more compact than the others described herein (and is referred to herein as Boost), but that operates in a similar fashion (i.e., speed, frequency, amplitude, etc.). Any of the components or concepts discussed above can be used in this device. In a preferred embodiment, the device 500 includes a brushless motor that includes the necessary torque in a relatively small space (e.g., outer diameter 40mm, length 38mm). In a preferred embodiment, the structure of the device is generally linear (cylindrical), as shown in FIGS. 39 and 40. In FIG. 40, the "m" refers to the motor and the "b" refers to batteries. Preferably, the device is small enough to fit in a ski jacket or a purse.

[00126] The battery configuration can be 3S1P 18650 lithium-ion cells, but others can be used. The amplitude of this device can be around 12 mm, but any other amplitude discussed herein can be used. The product is based around the head and arm of the other devices described above. Due to the linear configuration, weight balance and symmetry are taken into account.

[00127] Although the operations of the method(s) herein are shown and described in a particular order, the order of the operations of each method may be altered so that certain operations may be performed in an inverse order or so that certain operations may be performed, at least in part, concurrently with other operations. In another embodiment, instructions or sub-operations of distinct operations may be implemented in an intermittent and/or alternating manner.

[00128] Unless the context clearly requires otherwise, throughout the description and the claims, the words "comprise," "comprising," and the like are to be construed in an inclusive sense, as opposed to an exclusive or exhaustive sense; that is to say, in the sense of "including, but not limited to." As used herein, the terms "connected," "coupled," or any variant thereof, means any connection or coupling, either direct or indirect, between two or more elements; the coupling of connection between the elements can be physical, logical, or a combination thereof. Additionally, the words "herein," "above," "below," and words of similar import, when used in this application, shall refer to this application as a whole and not to any particular portions of this application. Where the context permits, words in the above Detailed Description of the Preferred Embodiments using the singular or plural number may also include the plural or singular number respectively. The word "or" in reference to a list of two or more items, covers all of the following interpretations of the word: any of the items in the list, all of the items in the list, and any combination of the items in the list.

[00129] The above-detailed description of embodiments of the disclosure is not intended to be exhaustive or to limit the teachings to the precise form disclosed above. While specific embodiments of and examples for the disclosure are described above for illustrative purposes, various equivalent modifications are possible within the scope of the disclosure, as those skilled in the relevant art will recognize. For example, while processes or blocks are presented in a given order, alternative embodiments may perform routines having steps, or employ systems having blocks, in a different order, and some processes or blocks may be deleted, moved, added, subdivided, combined, and/or modified to provide alternative or subcombinations. Each of these processes or blocks may be implemented in a variety of different ways. Also, while processes or blocks are at times shown as being performed in series, these processes or blocks may instead be performed in parallel, or may be

performed, at different times. Further any specific numbers noted herein are only examples: alternative implementations may employ differing values or ranges.

[00130] The above-detailed description of embodiments of the disclosure is not intended to be exhaustive or to limit the teachings to the precise form disclosed above. While specific embodiments of and examples for the disclosure are described above for illustrative purposes, various equivalent modifications are possible within the scope of the disclosure, as those skilled in the relevant art will recognize. Further, any specific numbers noted herein are only examples: alternative implementations may employ differing values, measurements or ranges. It will be appreciated that any dimensions given herein are only exemplary and that none of the dimensions or descriptions are limiting on the present invention.

[00131] The teachings of the disclosure provided herein can be applied to other systems, not necessarily the system described above. The elements and acts of the various embodiments described above can be combined to provide further embodiments.

[00132] Any patents and applications and other references noted above, including any that may be listed in accompanying filing papers, are incorporated herein by reference in their entirety. Aspects of the disclosure can be modified, if necessary, to employ the systems, functions, and concepts of the various references described above to provide yet further embodiments of the disclosure.

[00133] These and other changes can be made to the disclosure in light of the above Detailed Description of the Preferred Embodiments. While the above description describes certain embodiments of the disclosure, and describes the best mode contemplated, no matter how detailed the above appears in text, the teachings can be practiced in many ways. Details of the system may vary considerably in its implementation details, while still being encompassed by the subject matter disclosed herein. As noted above, particular

terminology used when describing certain features or aspects of the disclosure should not be taken to imply that the terminology is being redefined herein to be restricted to any specific characteristics, features or aspects of the disclosure with which that terminology is associated. In general, the terms used in the following claims should not be construed to limit the disclosures to the specific embodiments disclosed in the specification unless the above Detailed Description of the Preferred Embodiments section explicitly defines such terms. Accordingly, the actual scope of the disclosure encompasses not only the disclosed embodiments, but also all equivalent ways of practicing or implementing the disclosure under the claims.

[00134] While certain aspects of the disclosure are presented below in certain claim forms, the inventors contemplate the various aspects of the disclosure in any number of claim forms. For example, while only one aspect of the disclosure is recited as a means-plus-function claim under 35 U.S.C. §112, ¶6, other aspects may likewise be embodied as a means-plus-function claim, or in other forms, such as being embodied in a computer-readable medium. (Any claims intended to be treated under 35 U.S.C. §112, ¶6 will begin with the words "means for"). Accordingly, the applicant reserves the right to add additional claims after filing the application to pursue such additional claim forms for other aspects of the disclosure.

[00135] Accordingly, although exemplary embodiments of the invention have been shown and described, it is to be understood that all the terms used herein are descriptive rather than limiting, and that many changes, modifications, and substitutions may be made by one having ordinary skill in the art without departing from the spirit and scope of the invention.

FIG. 1

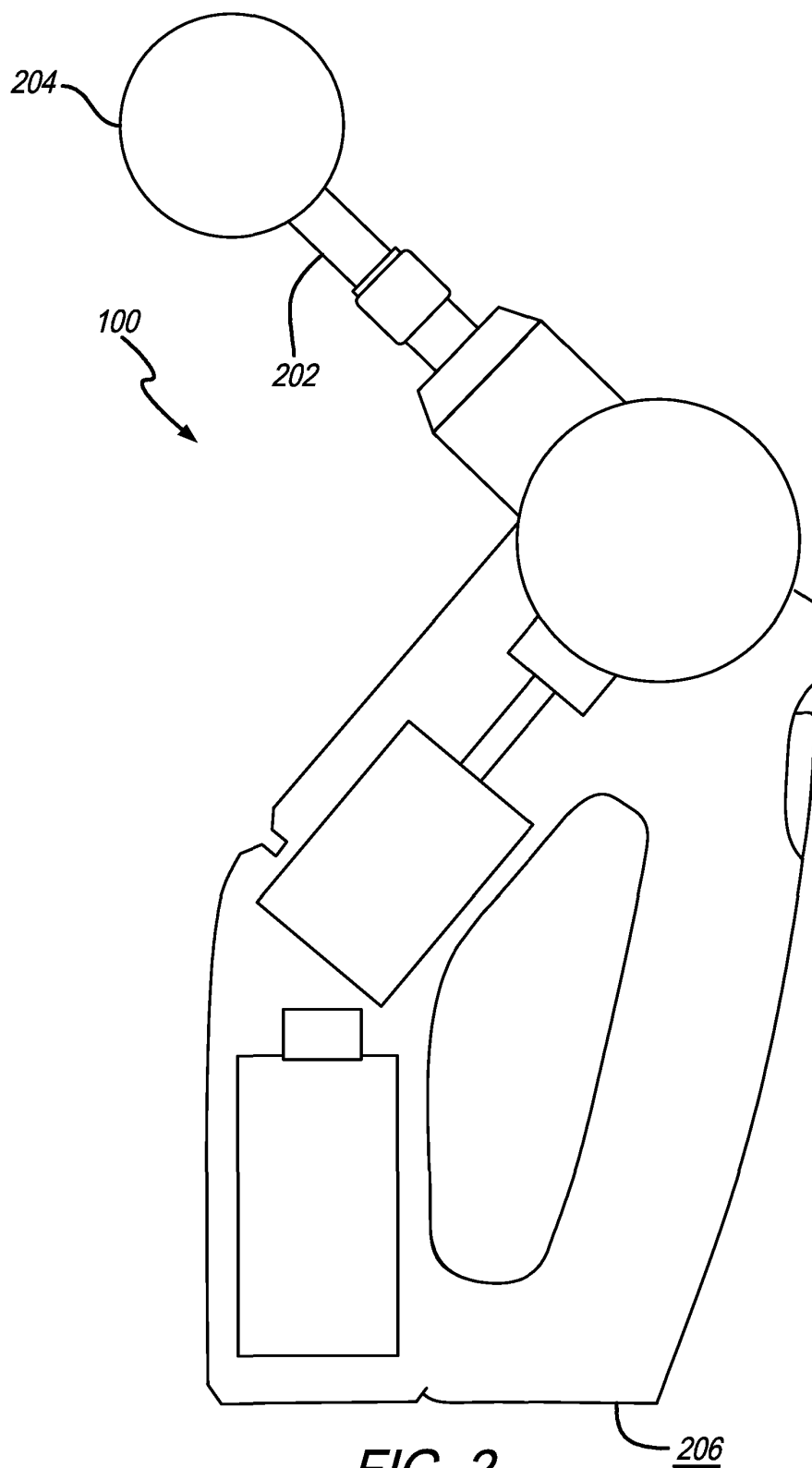


FIG. 2

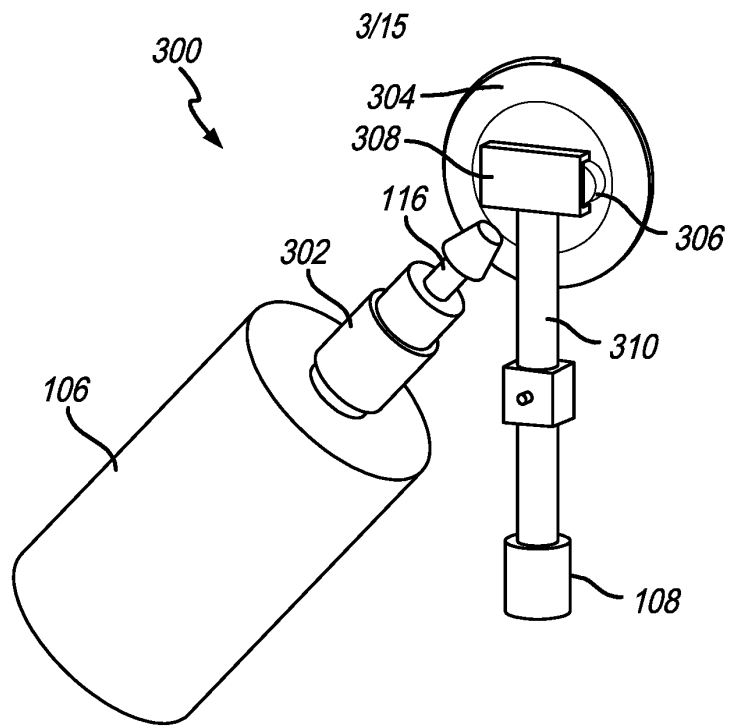


FIG. 3A

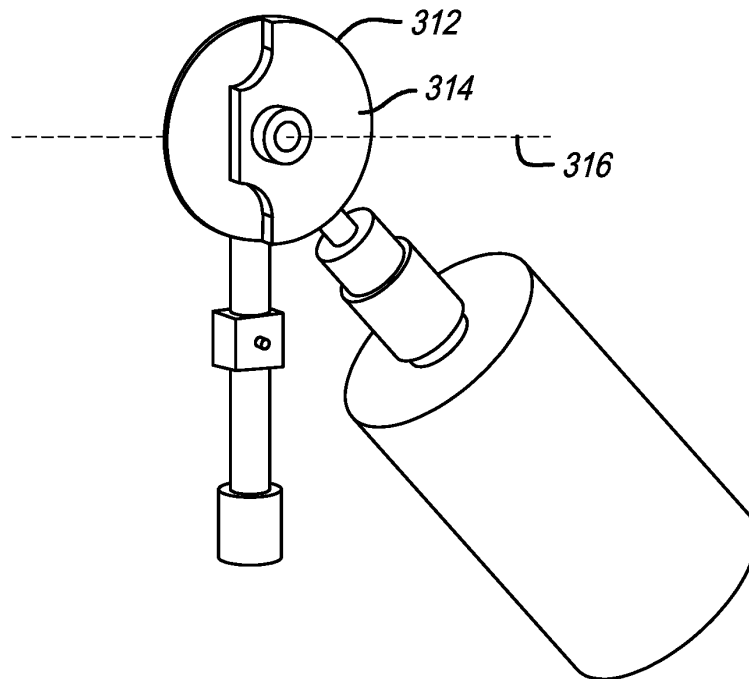
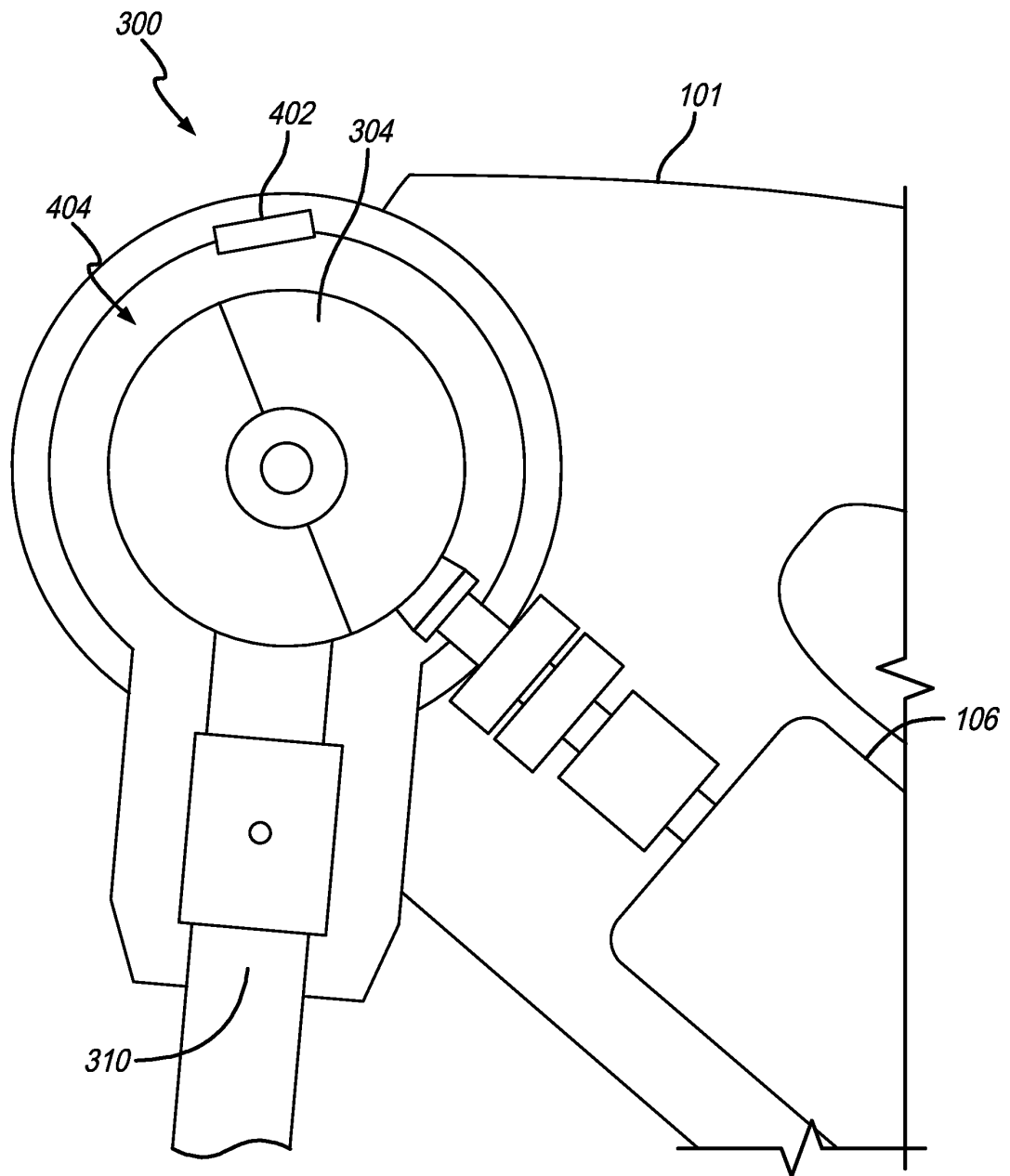


FIG. 3B

**FIG. 4**

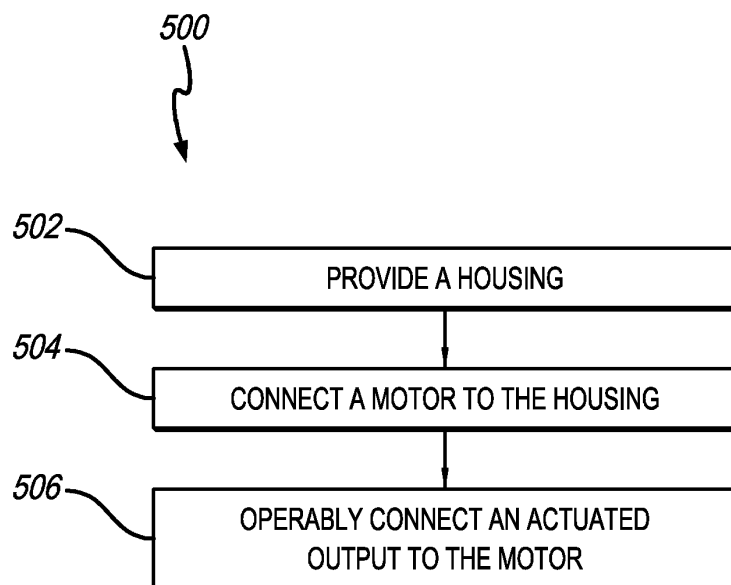


FIG. 5

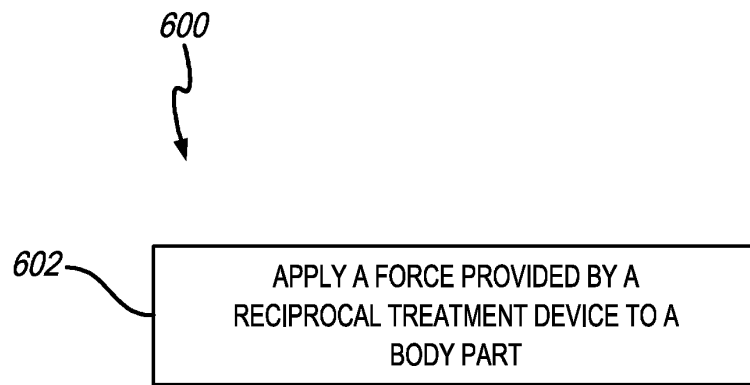


FIG. 6

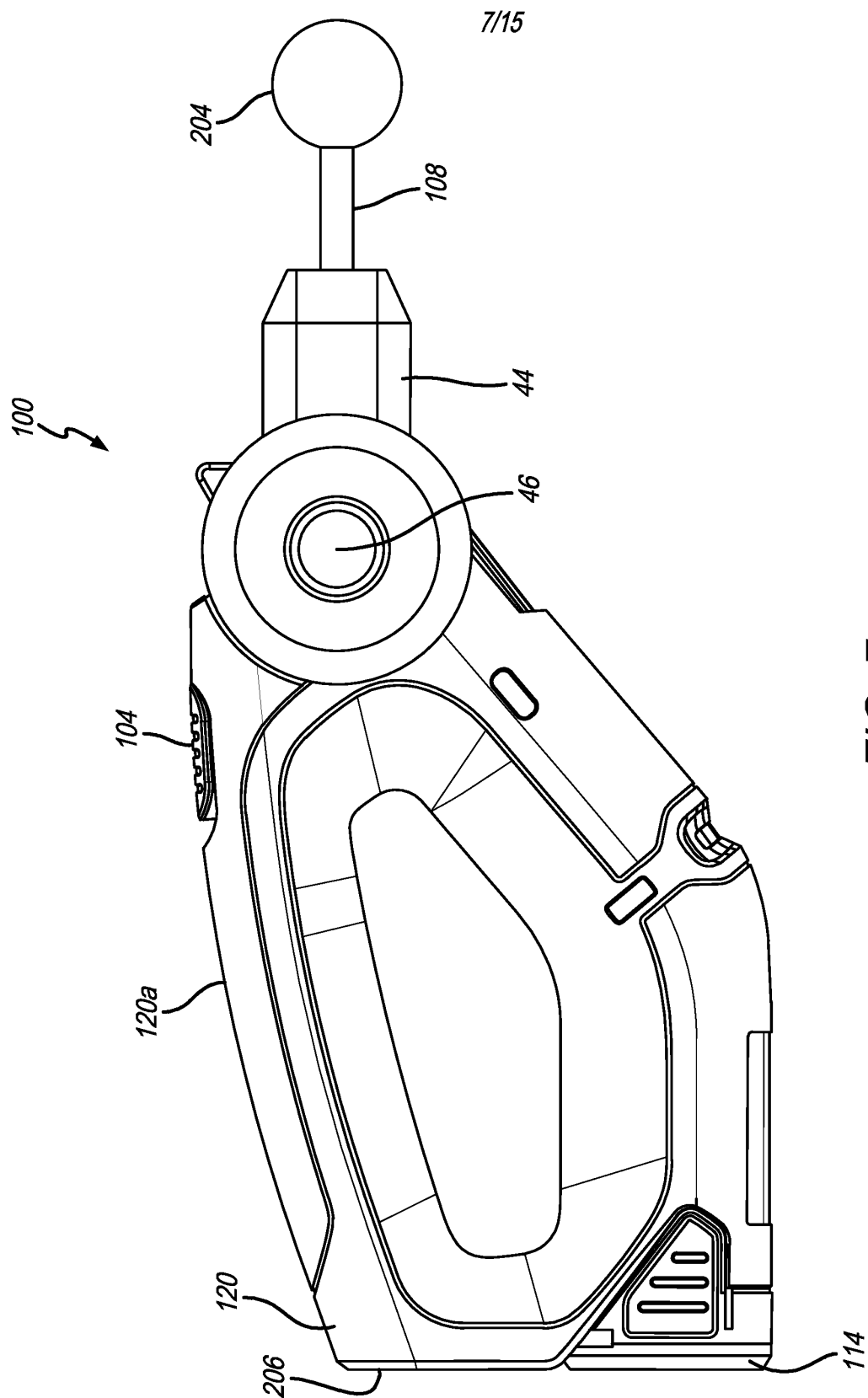
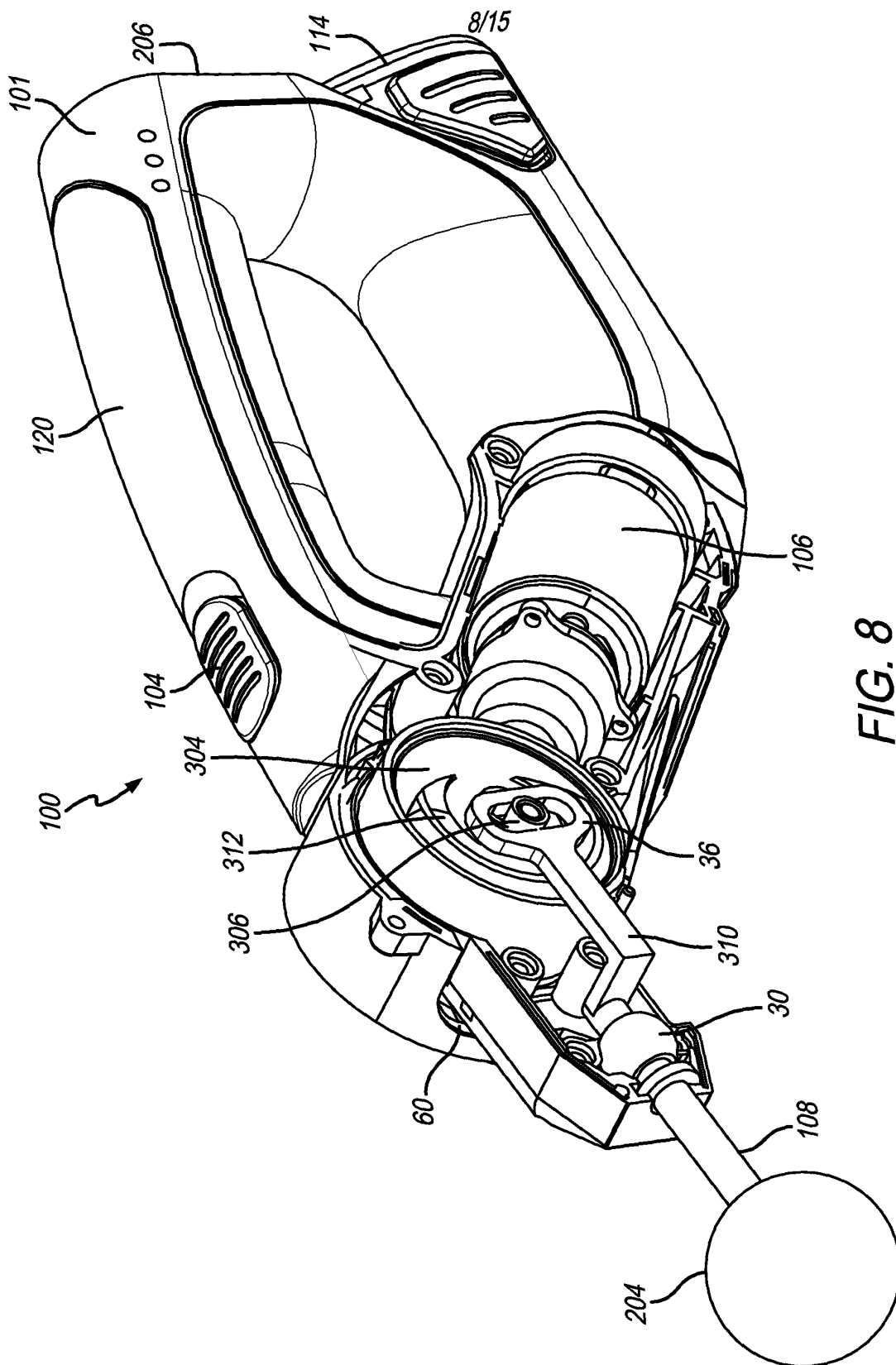


FIG. 7



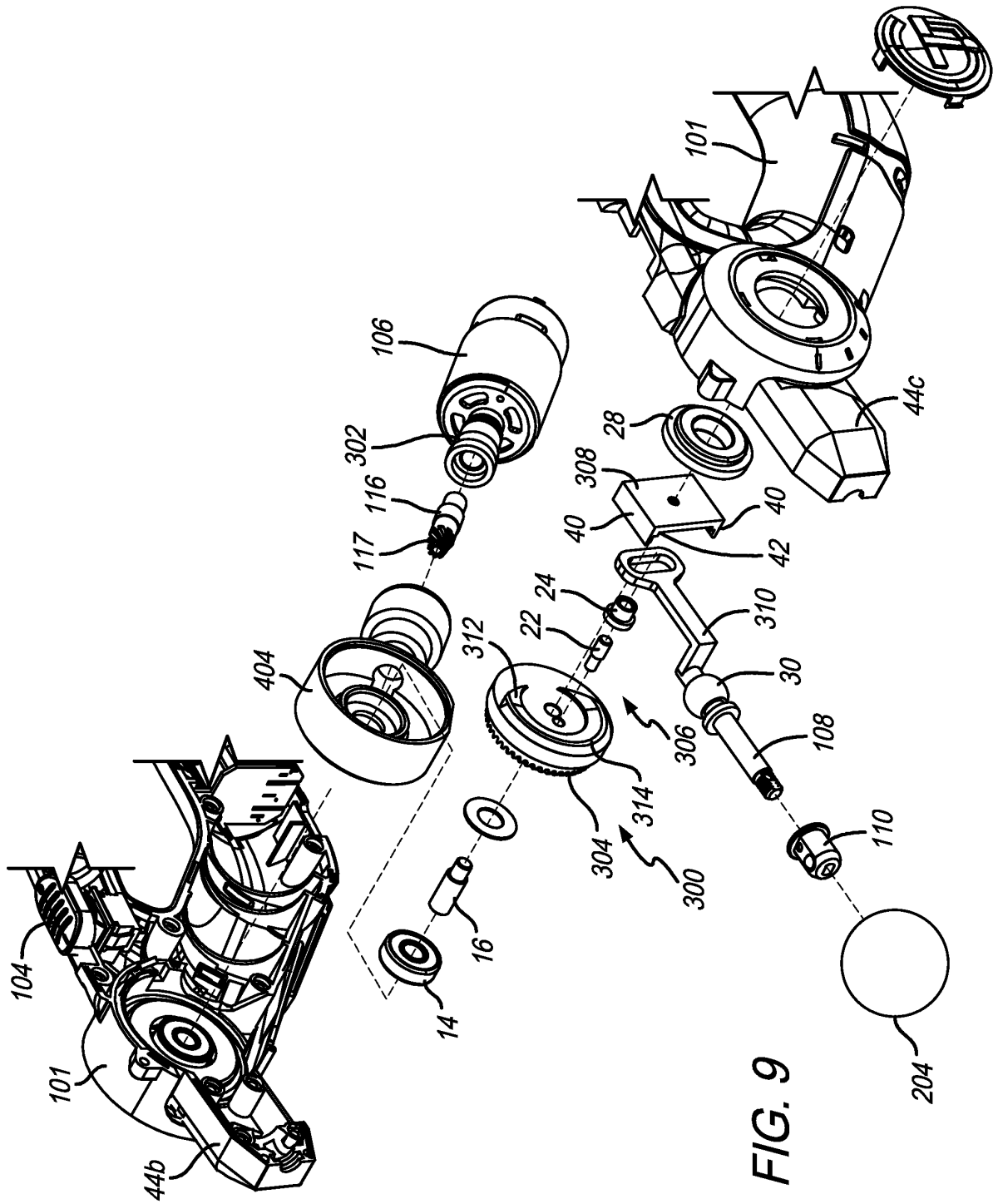


FIG. 9

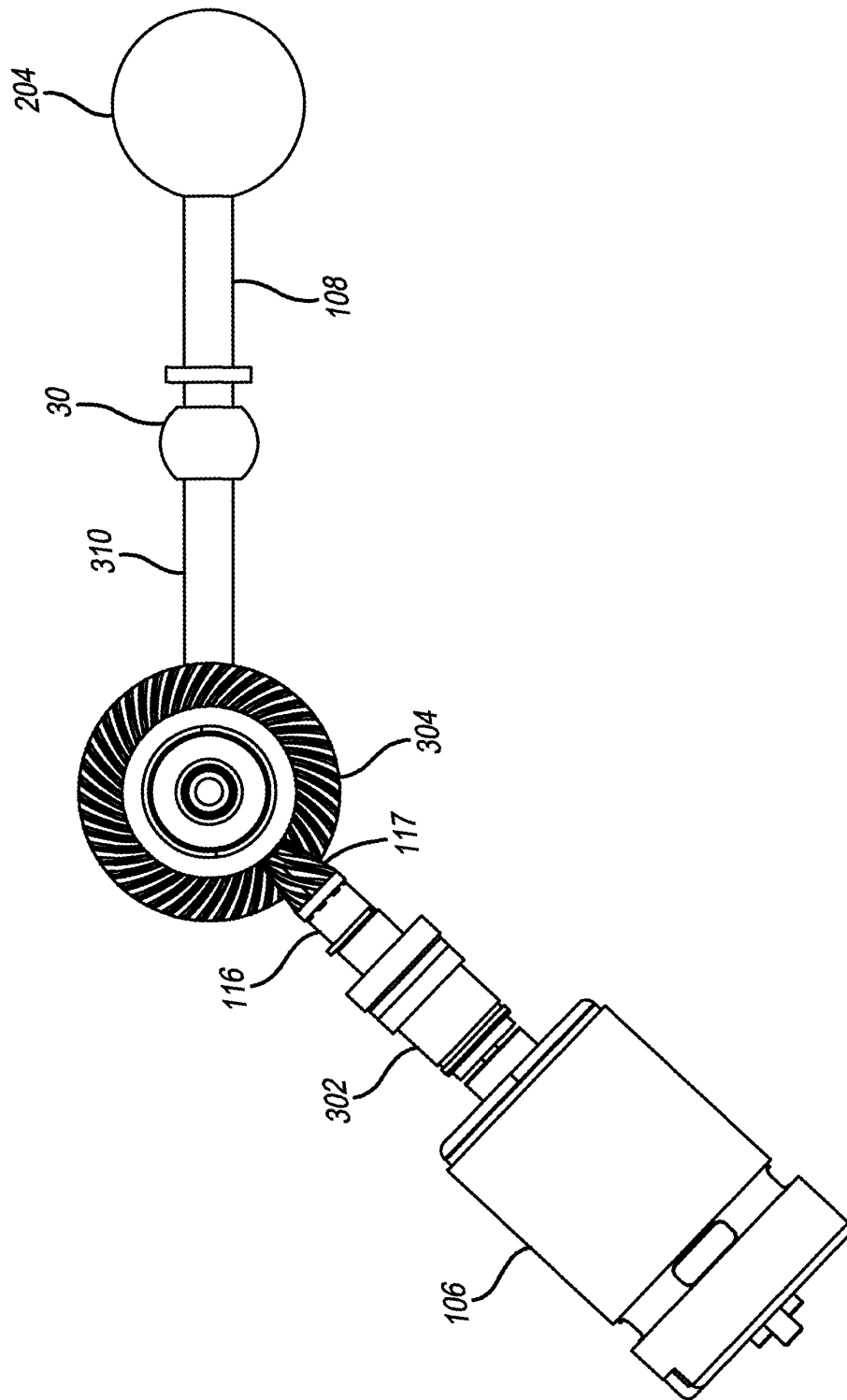


FIG. 10

11/15

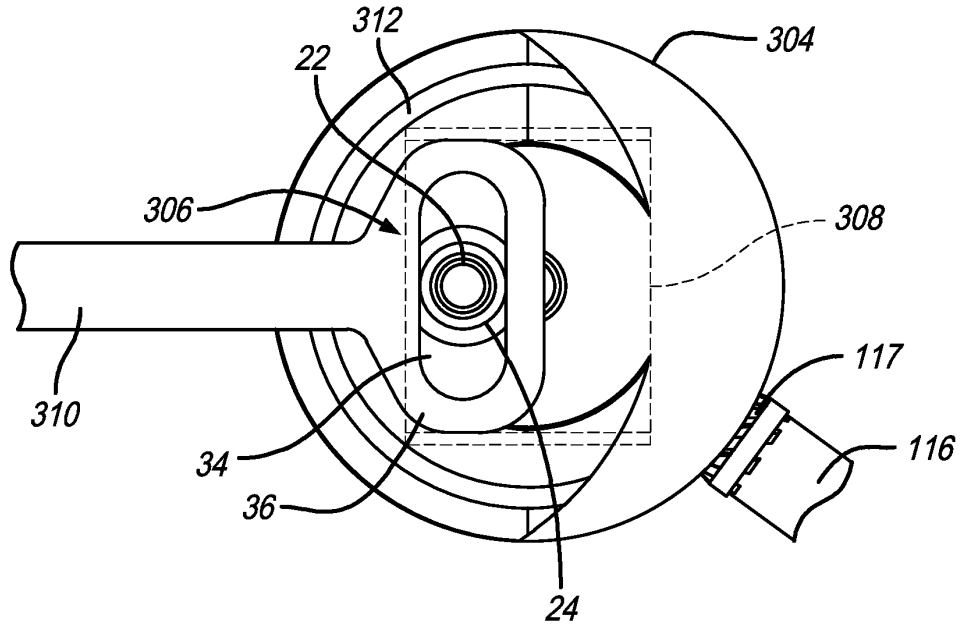


FIG. 11A

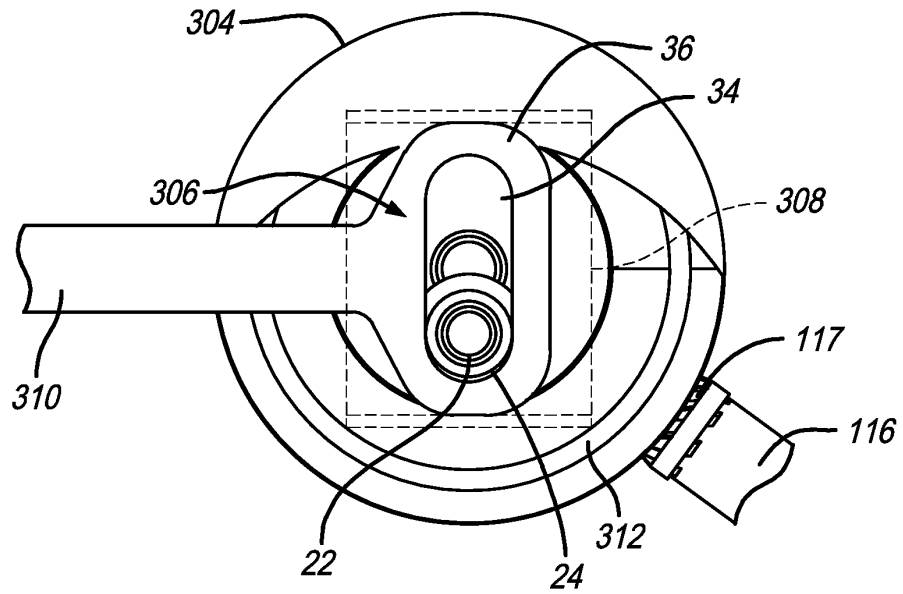


FIG. 11B

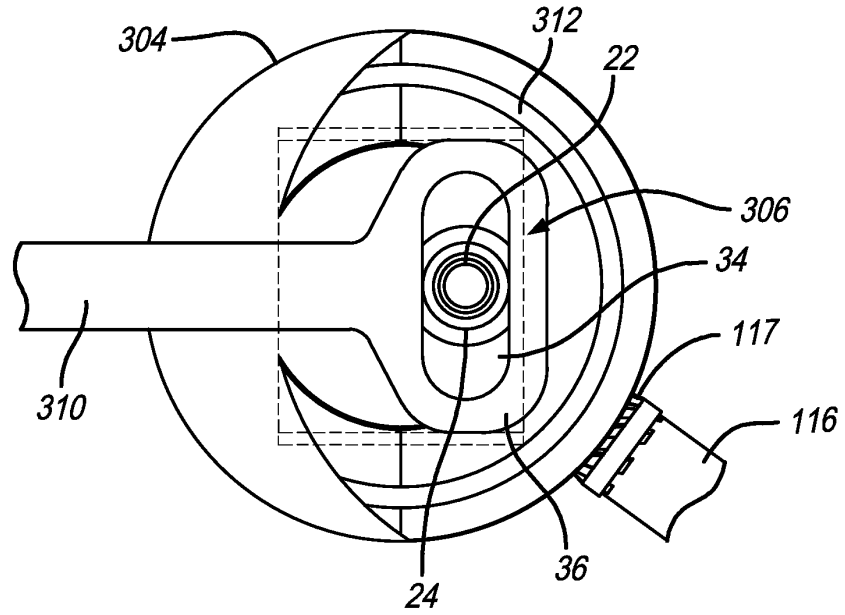


FIG. 11C

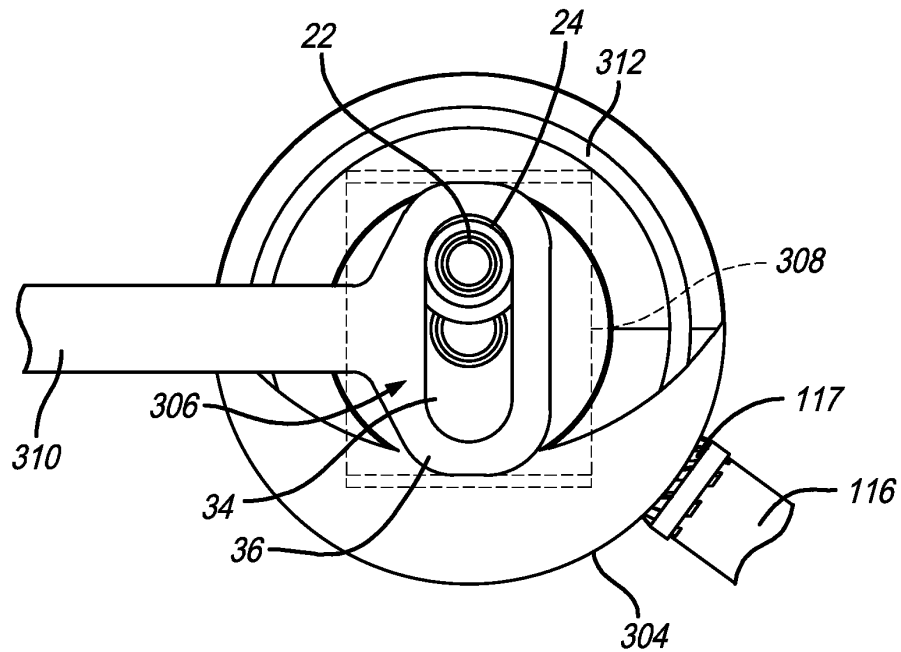


FIG. 11D

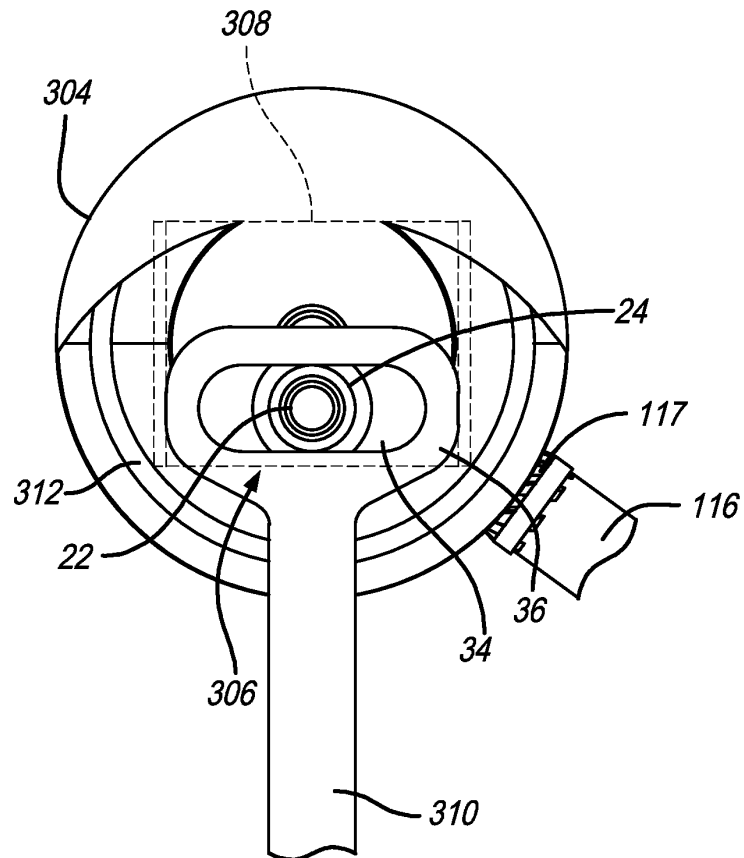


FIG. 11E

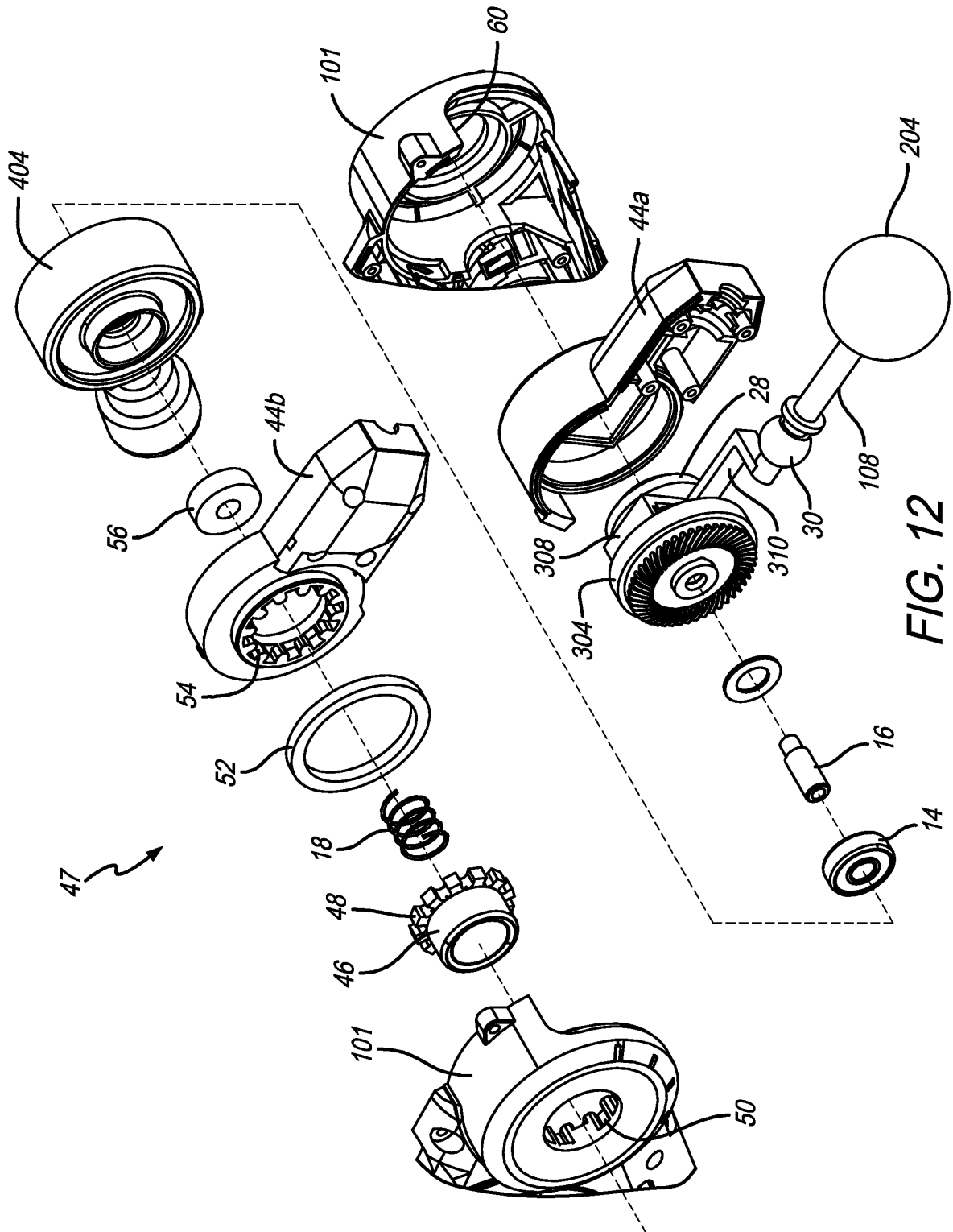


FIG. 12

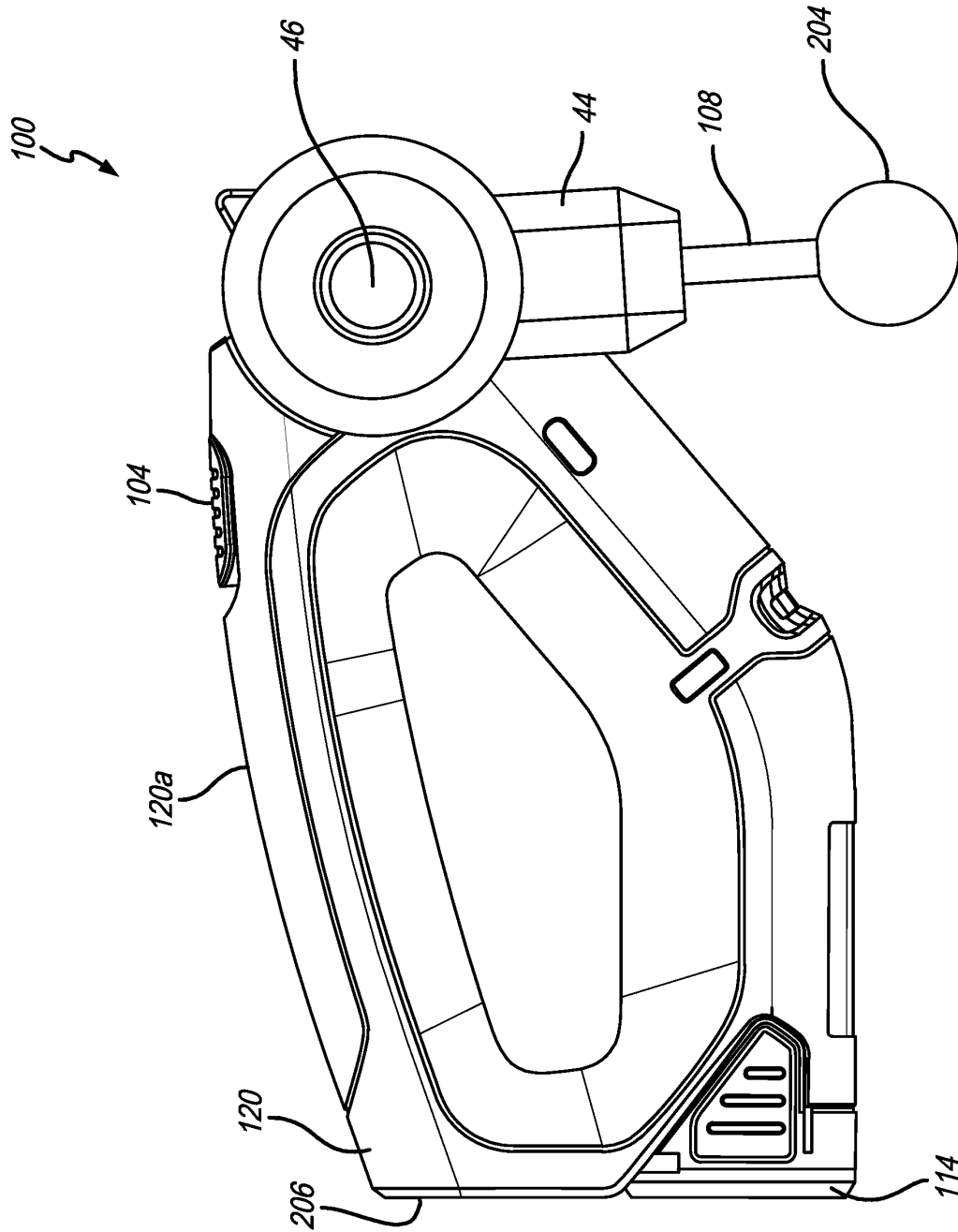


FIG. 13

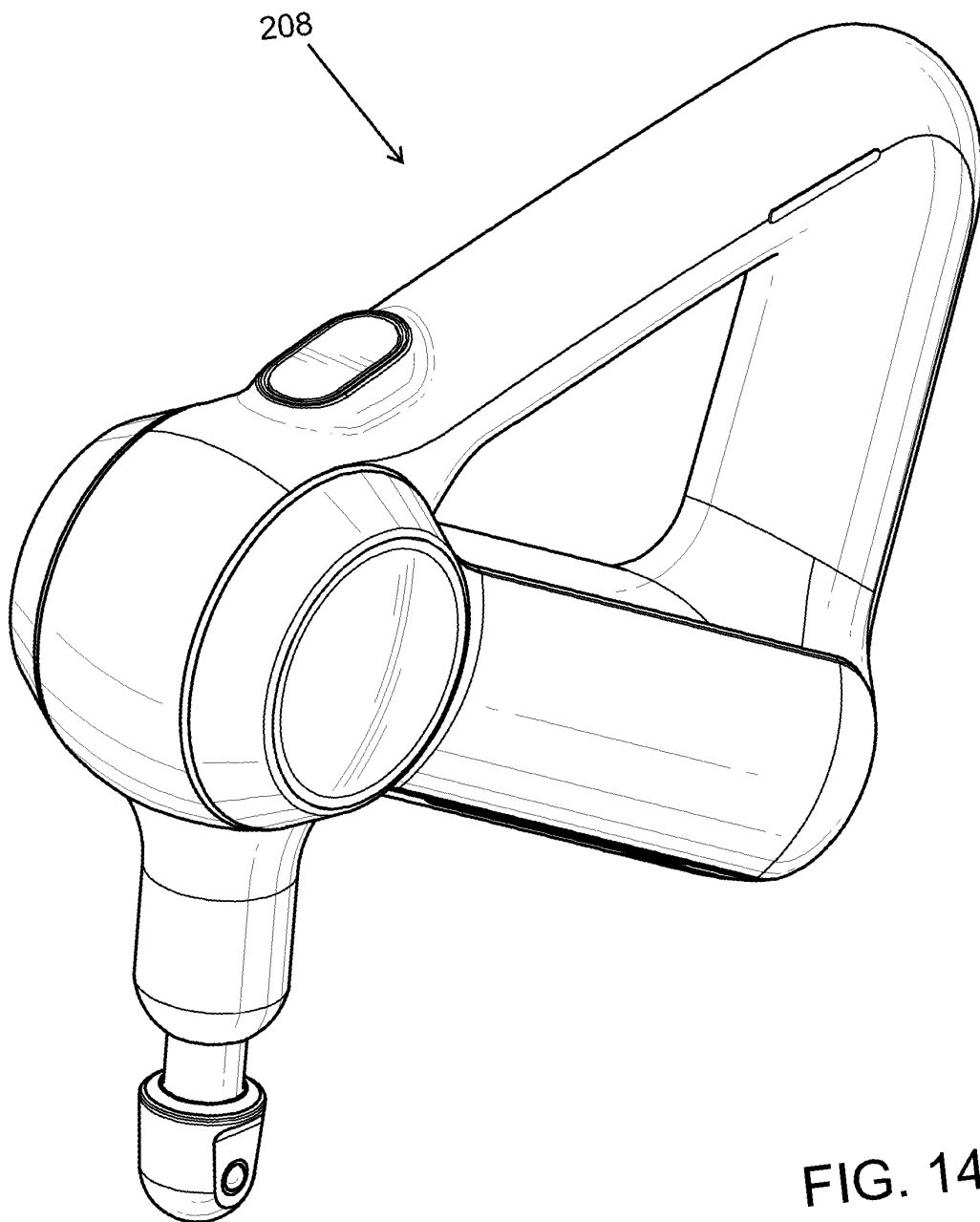


FIG. 14

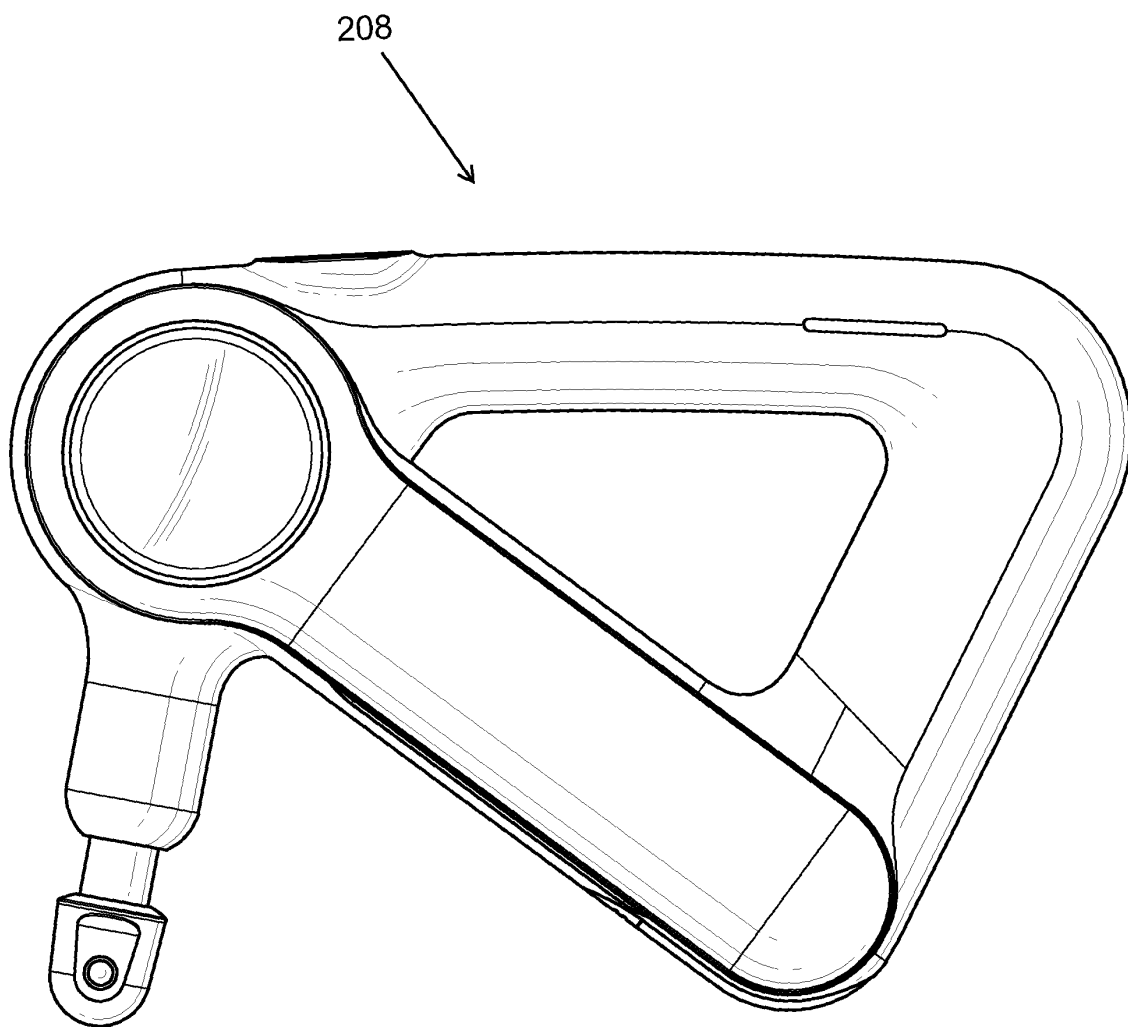


FIG. 15

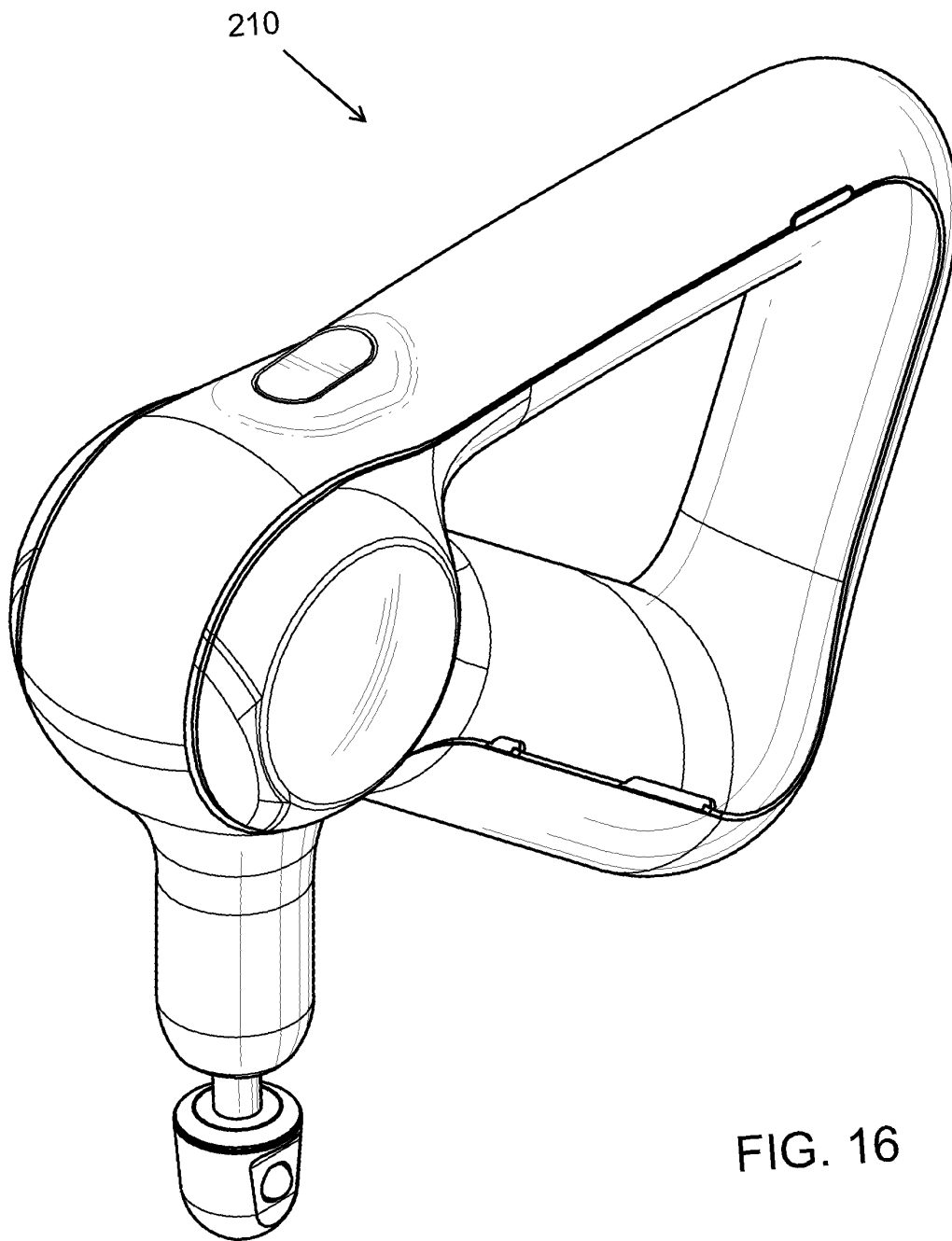


FIG. 16

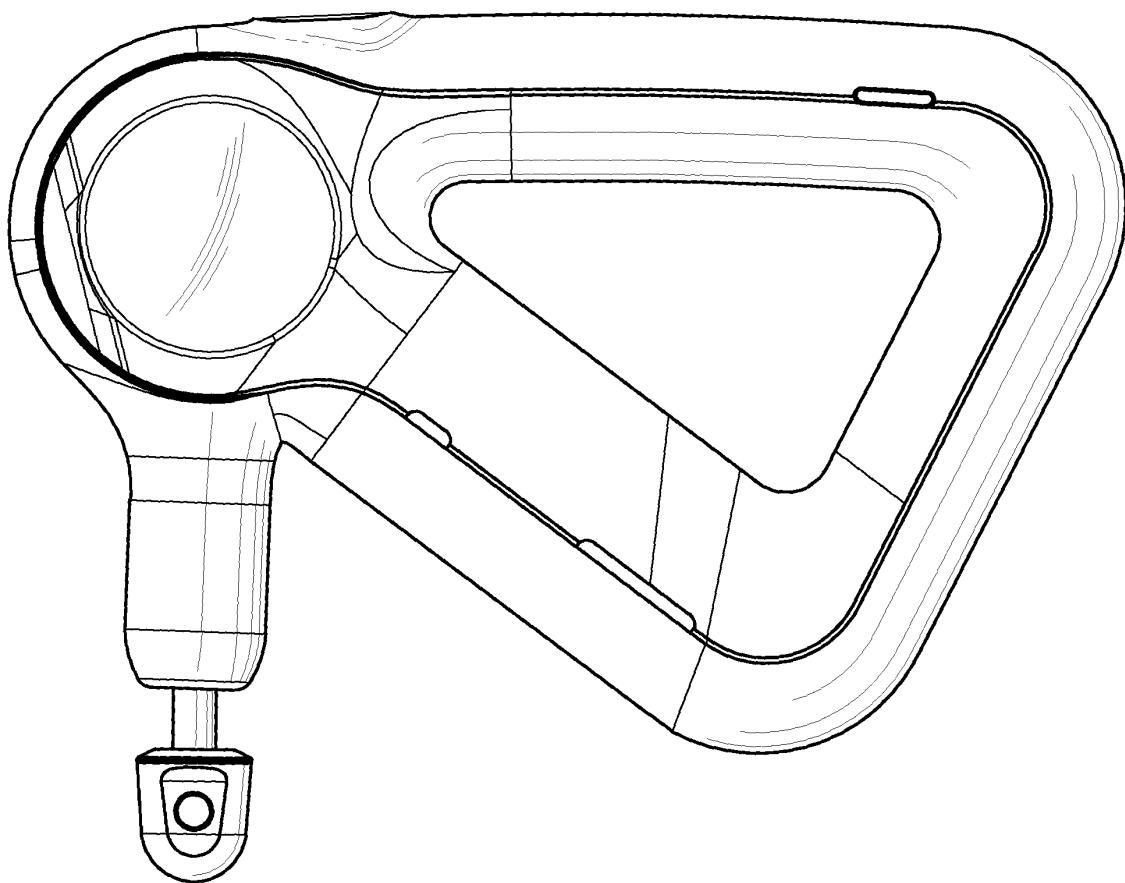


FIG. 17

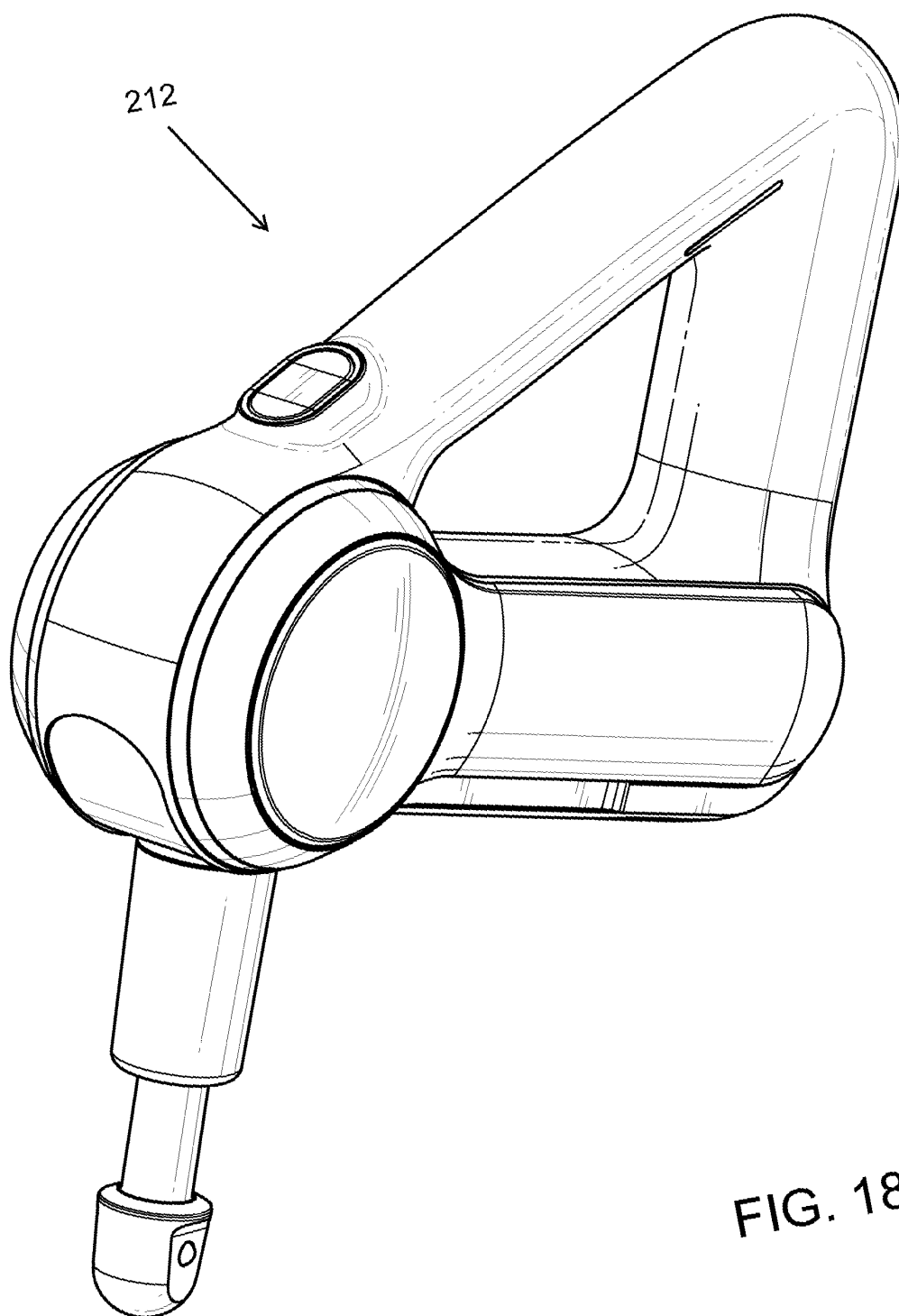


FIG. 18

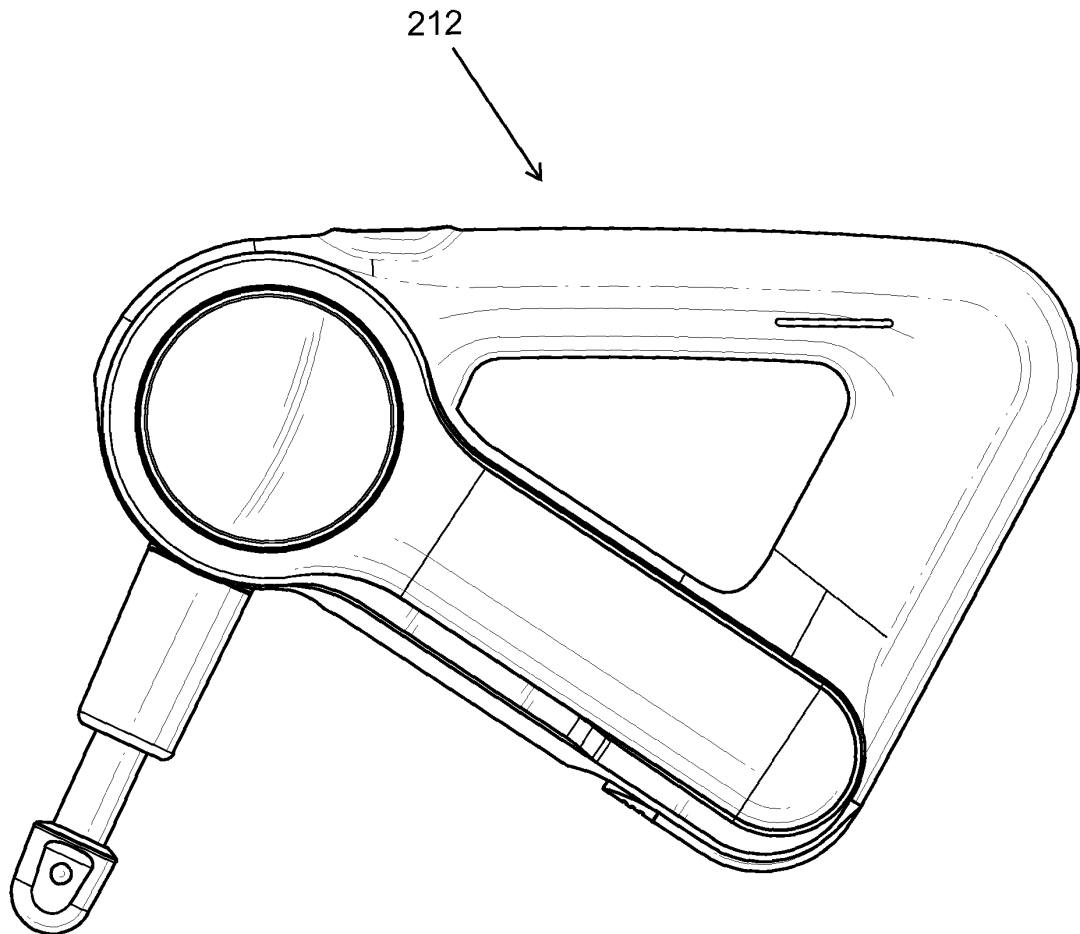


FIG. 19

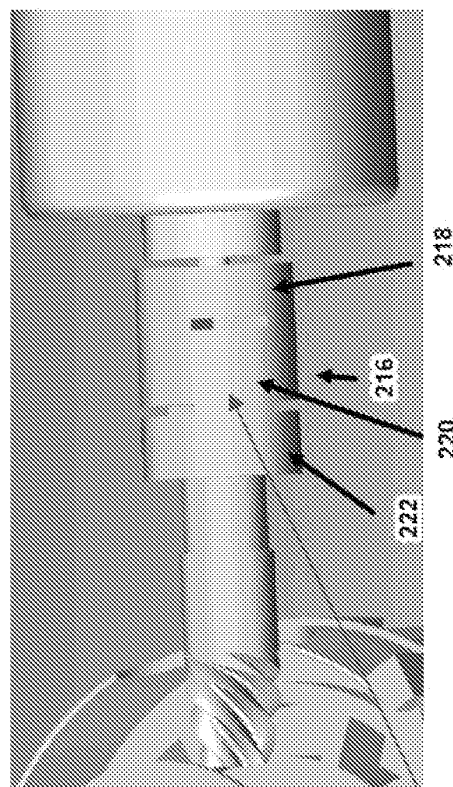


FIG. 21

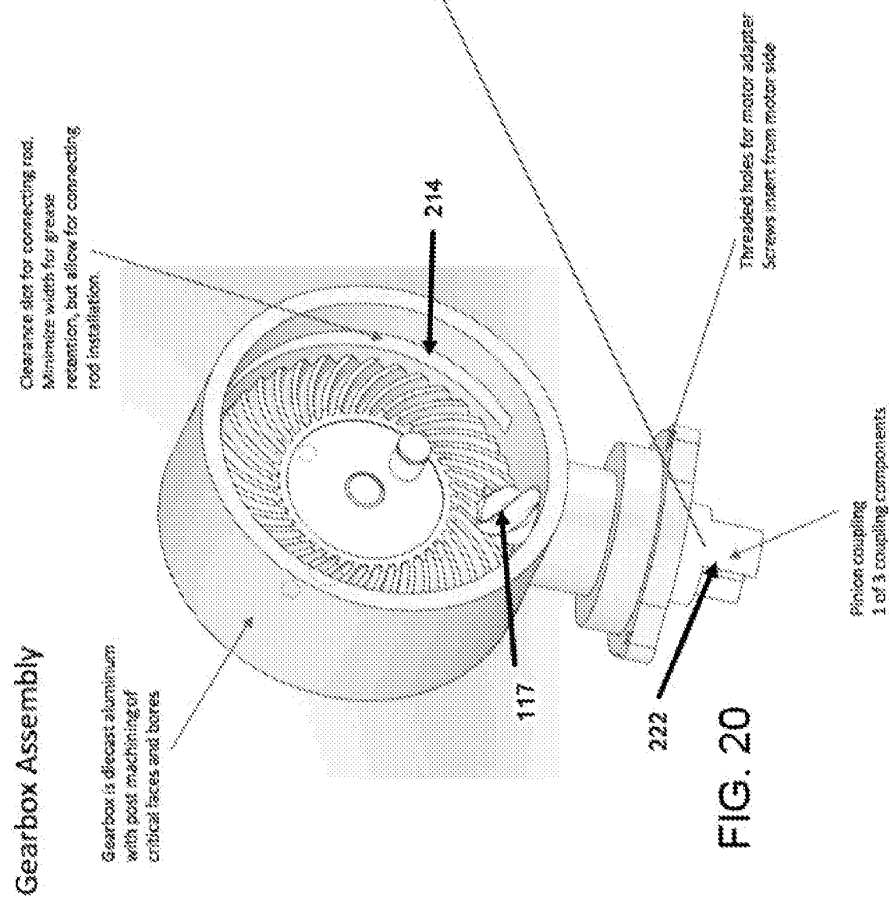
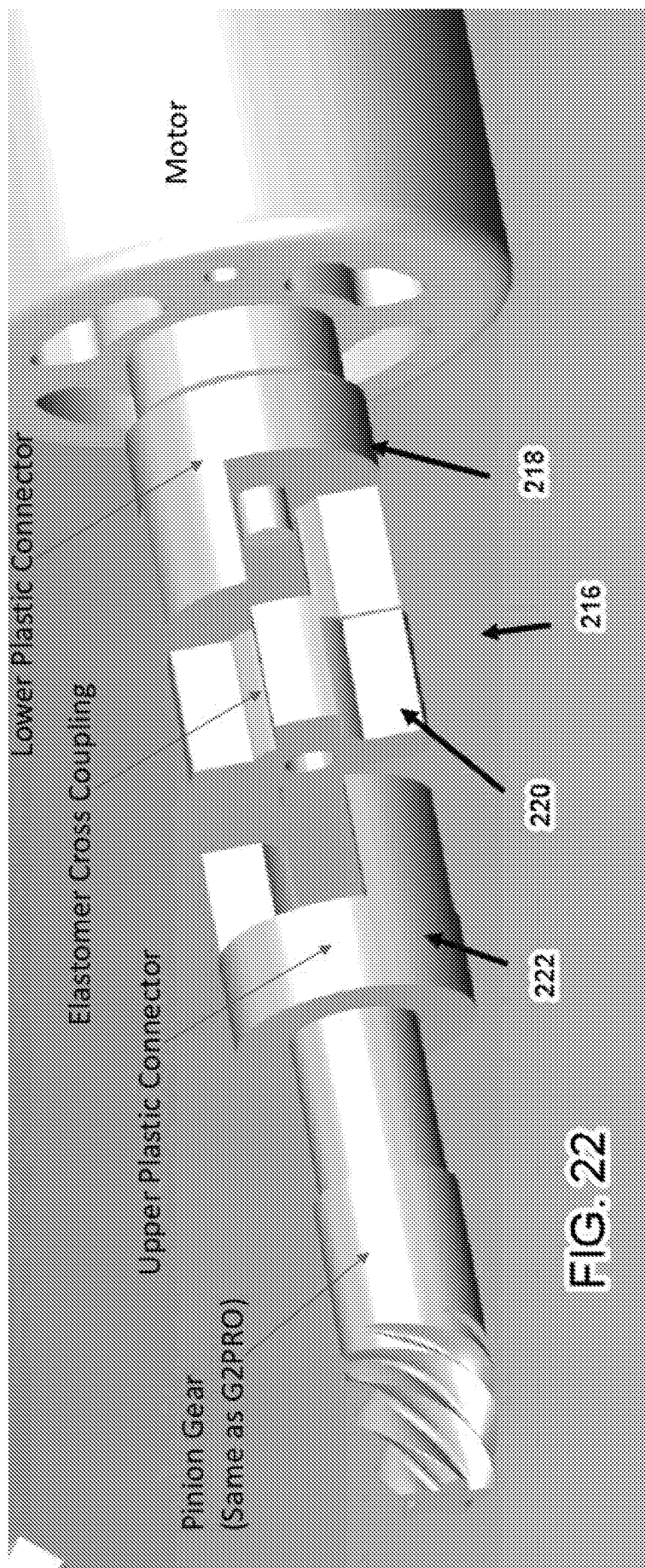
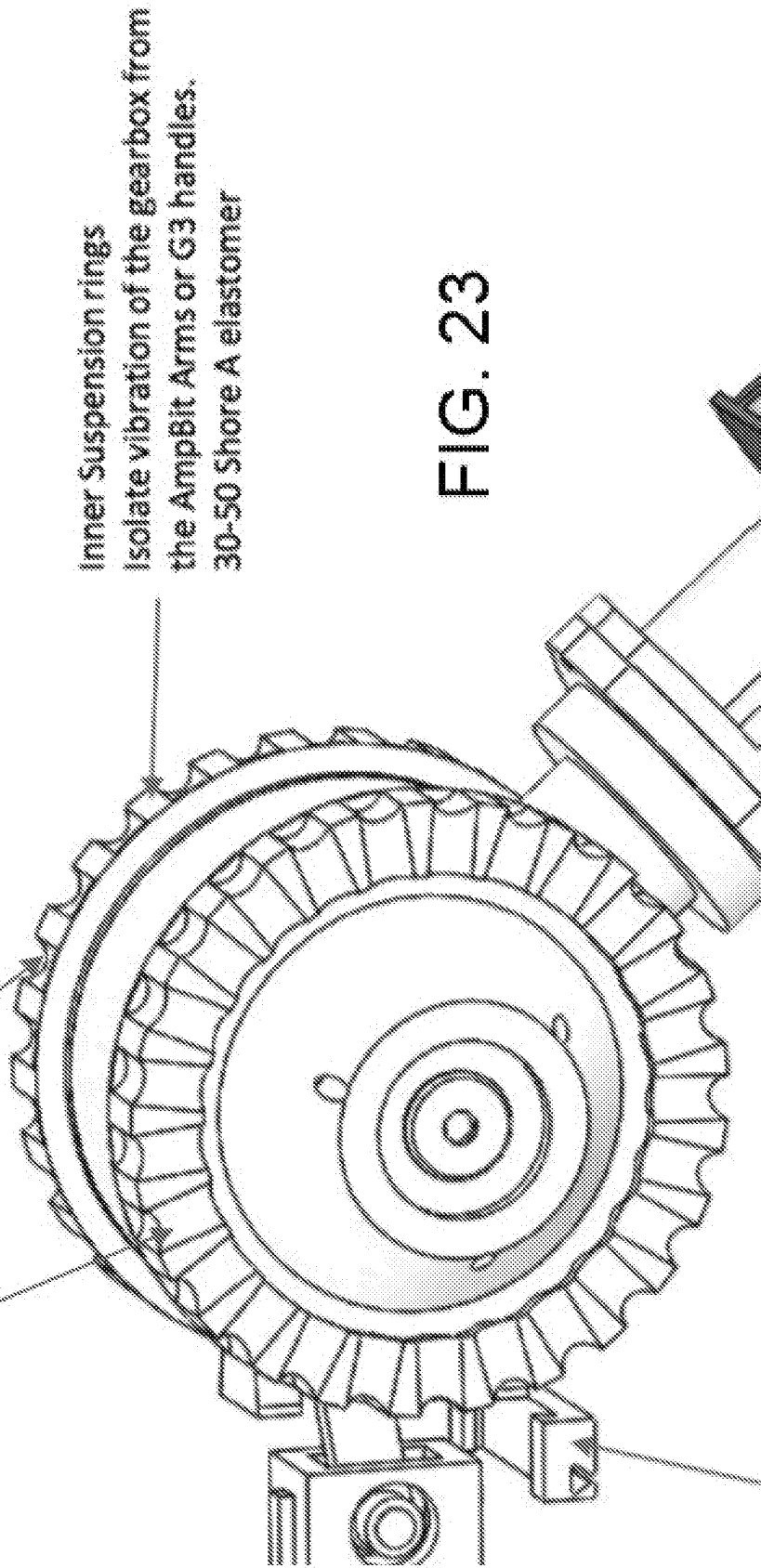


FIG. 20



To prevent the gearbox from transmitting vibrations to the housing we included a rubber cover.



Pushrod Adapter

Pushrod Assembly

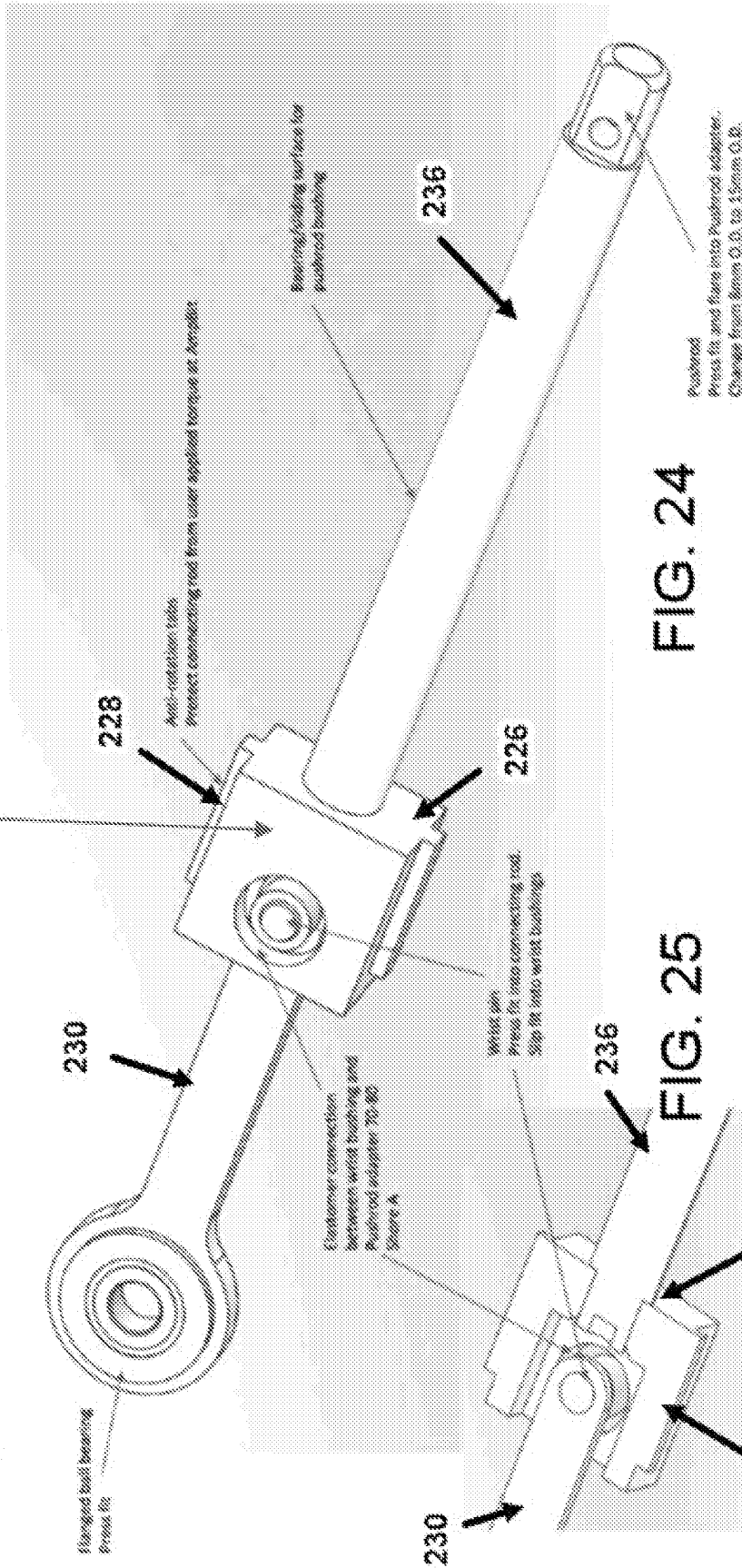


FIG. 24

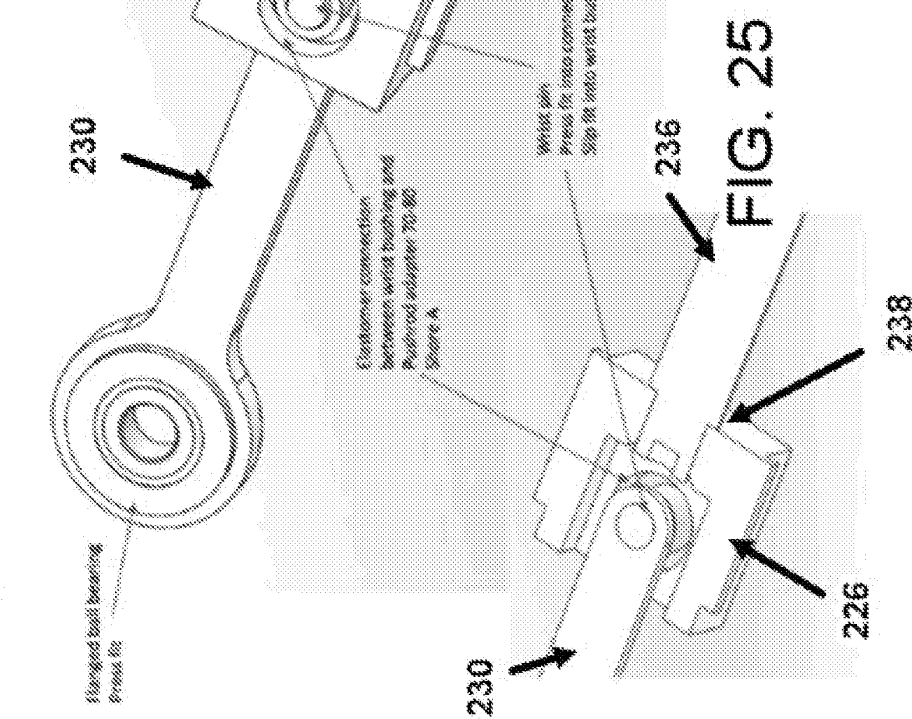


FIG. 25

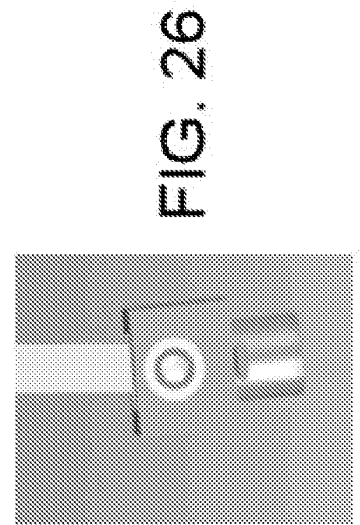
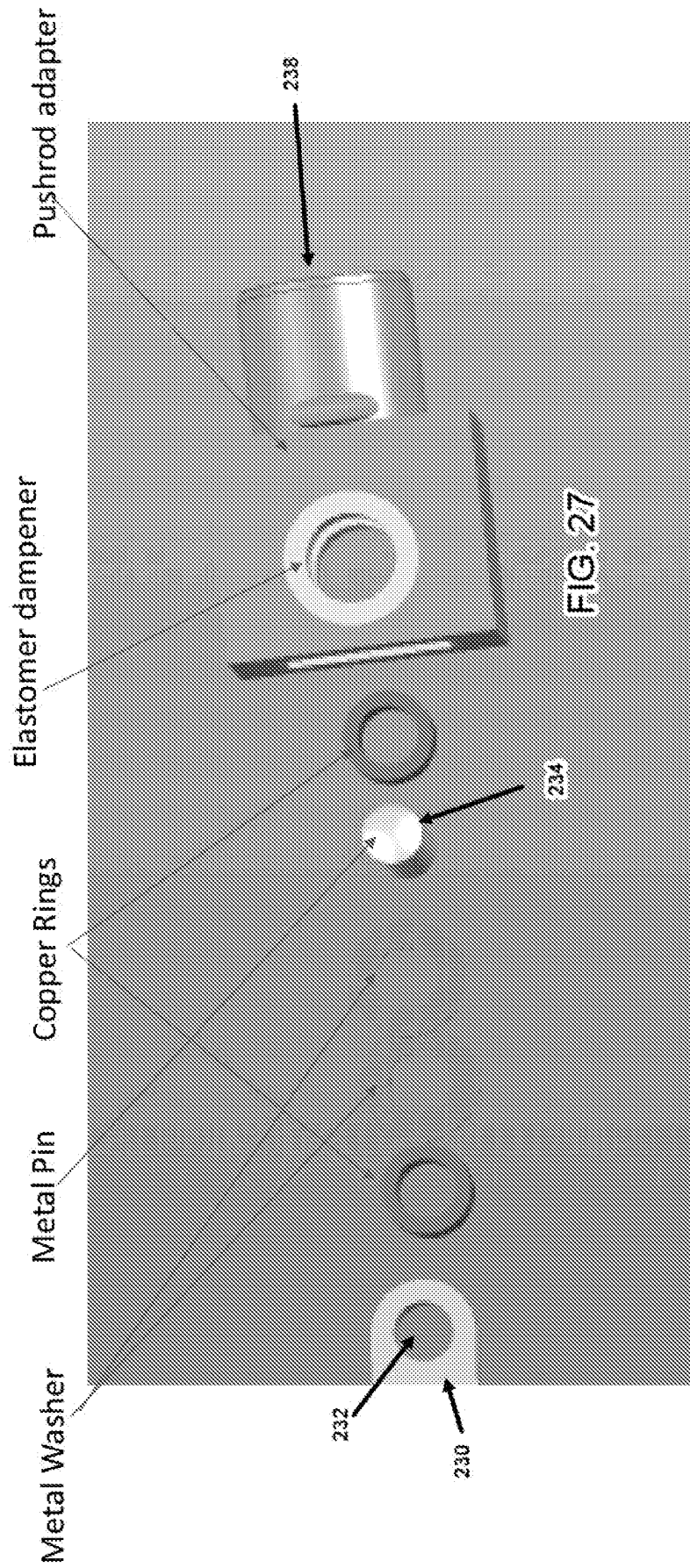


FIG. 26



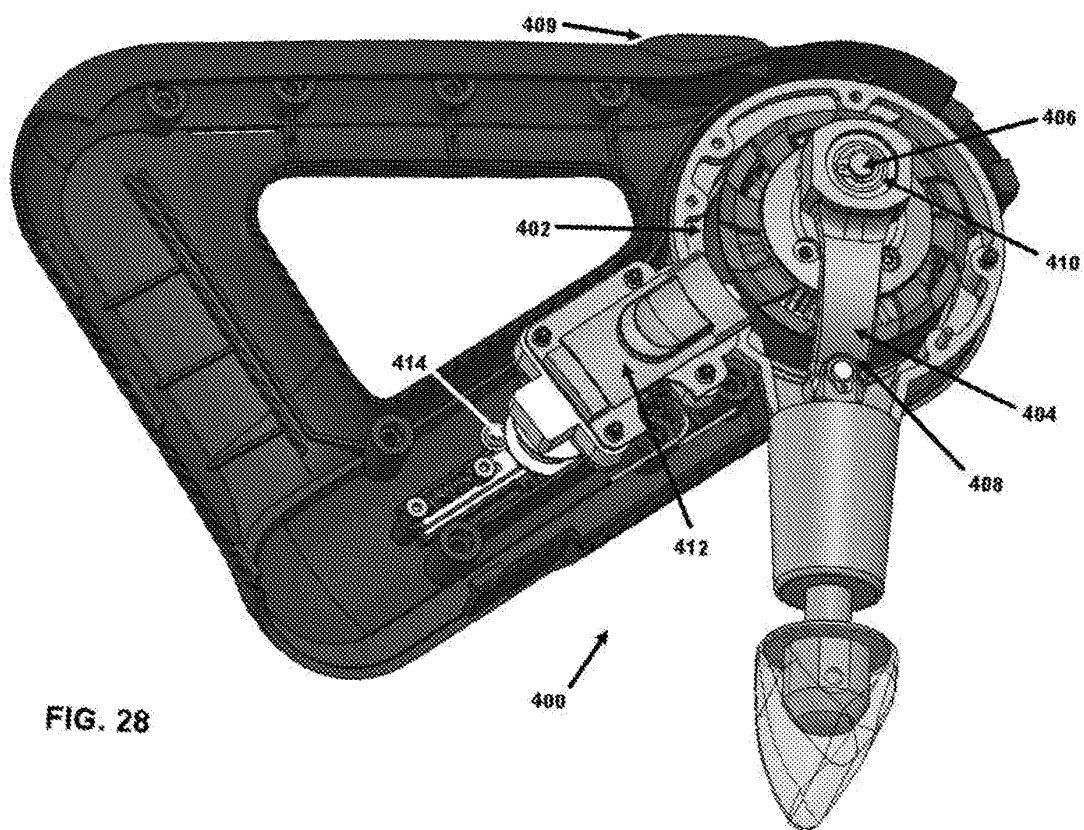
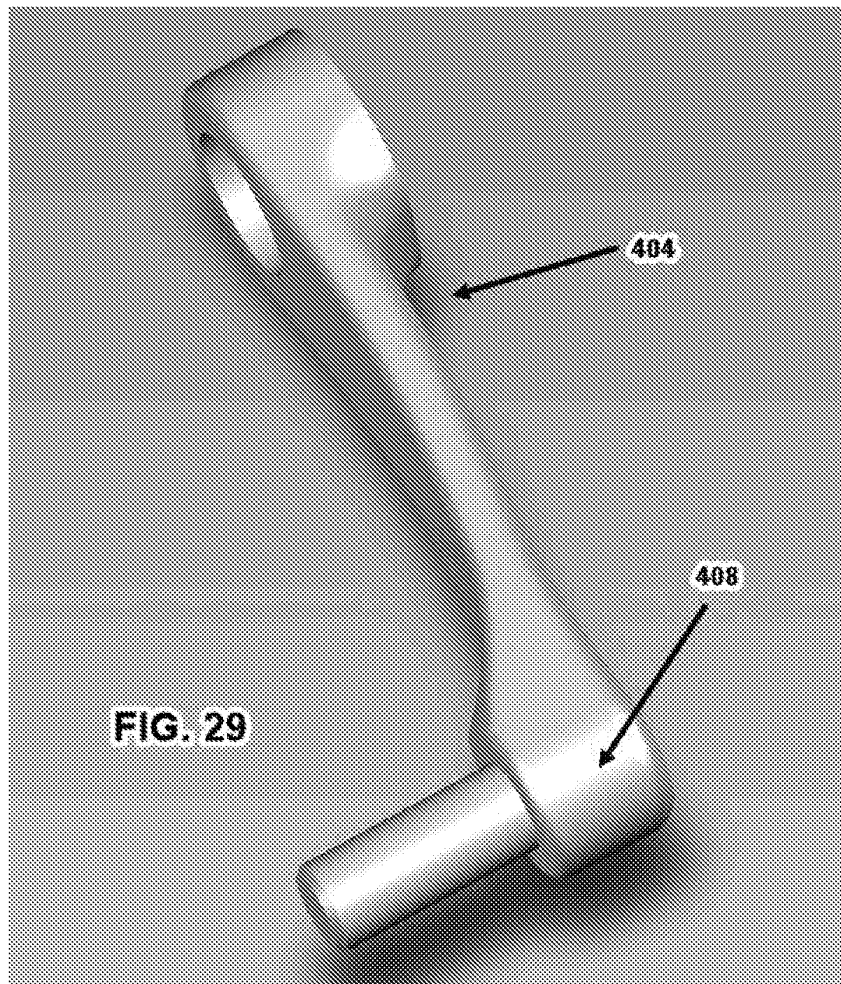
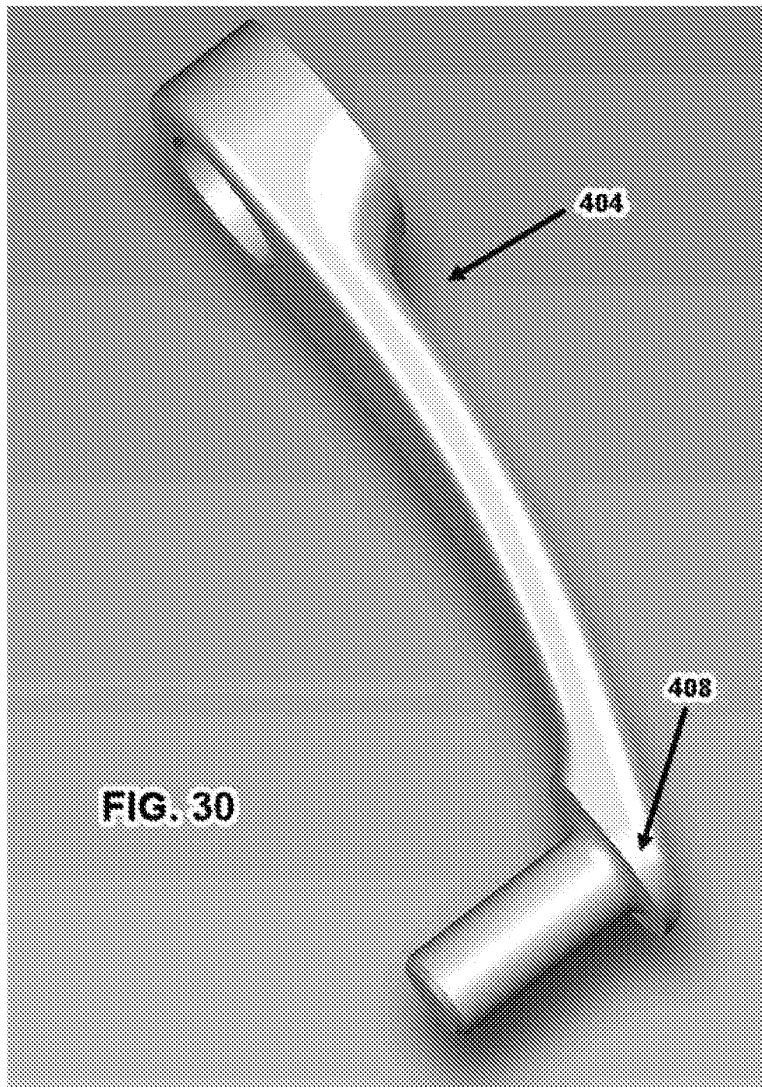
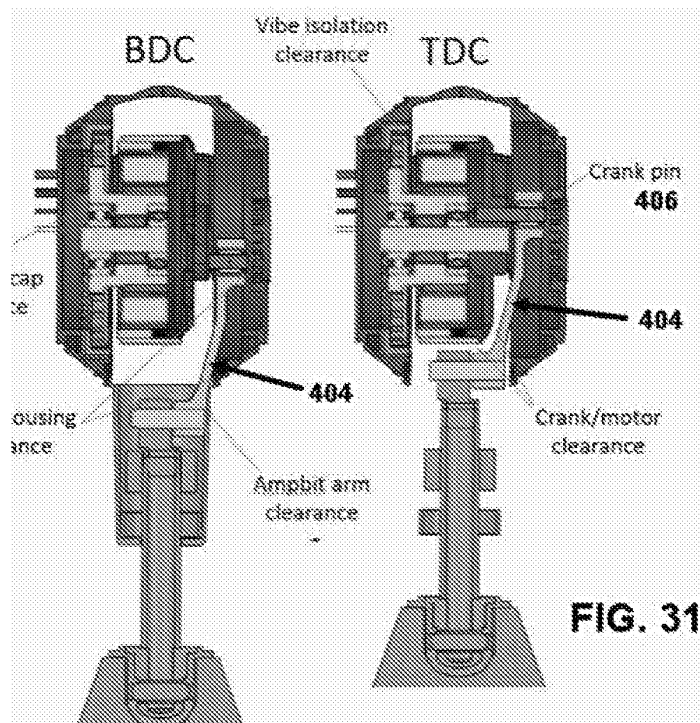
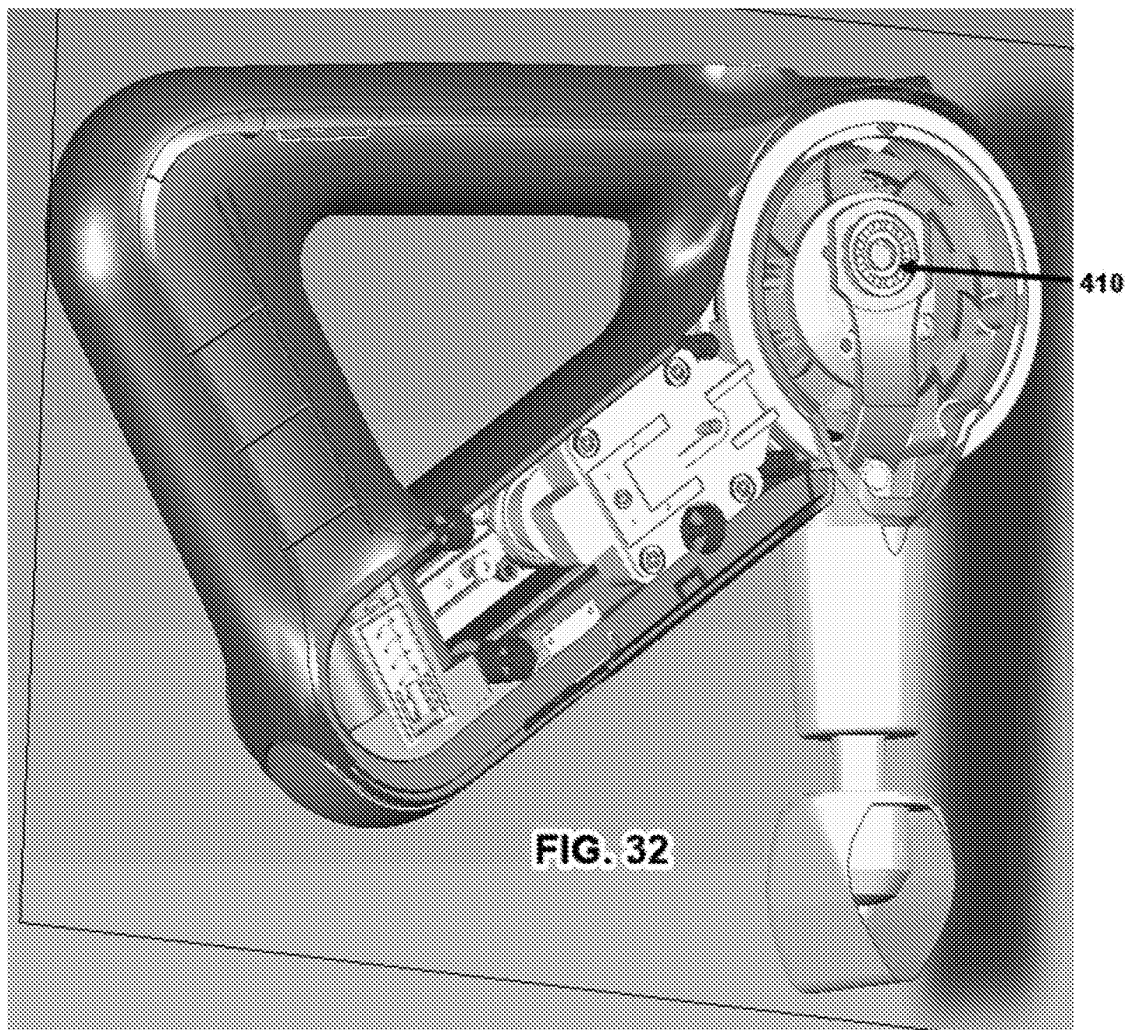


FIG. 28









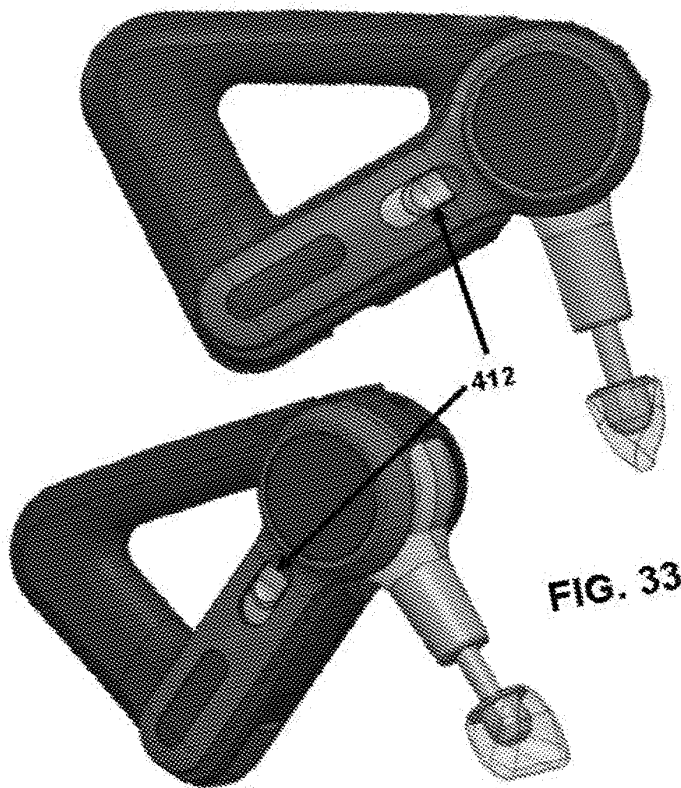
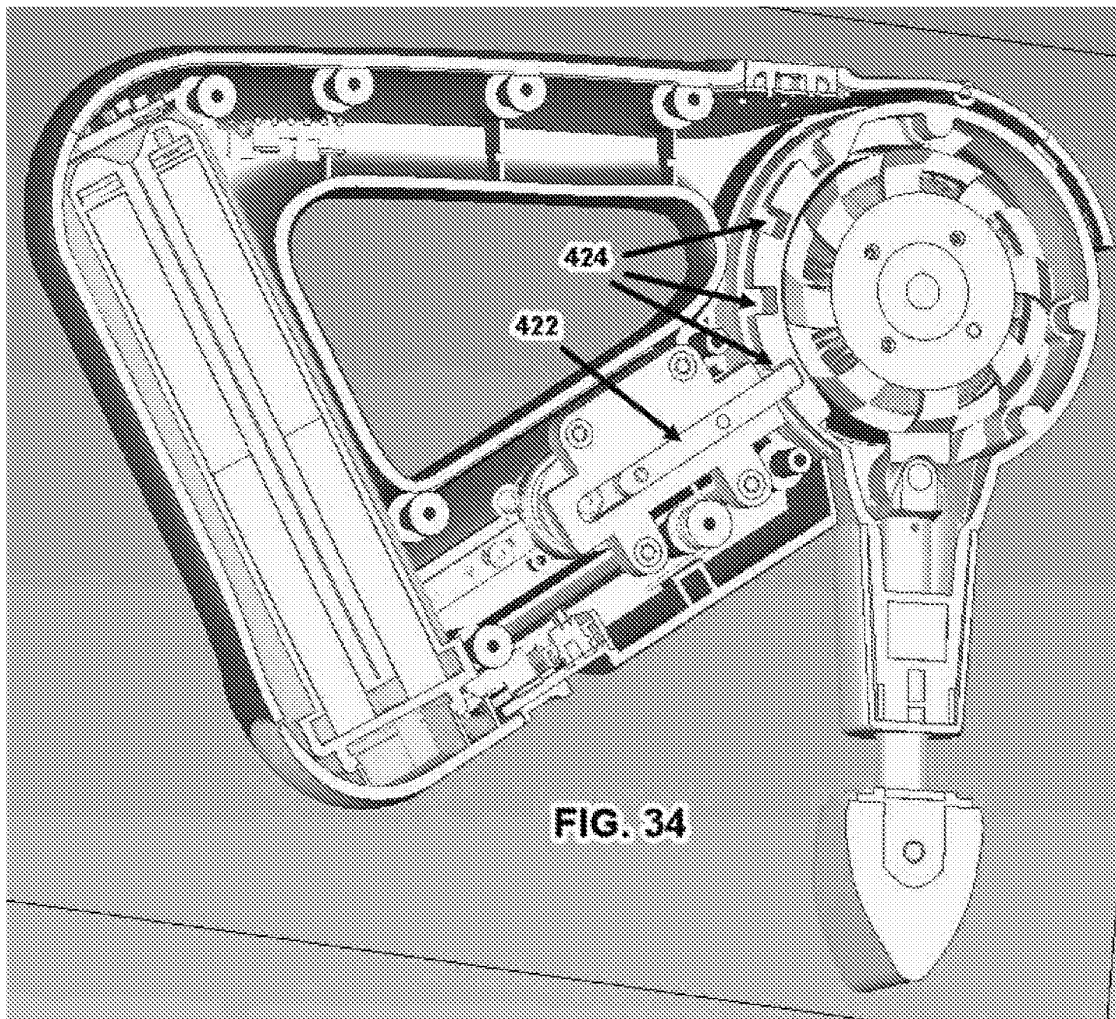
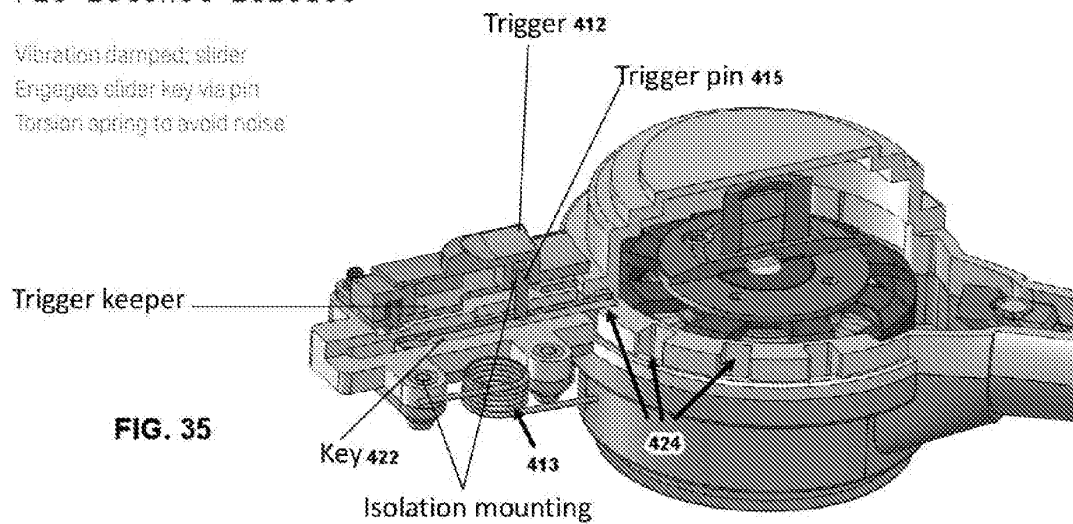


FIG. 33



G4 Pro ratchet release

- Vibration damped; slider
- Engages slider key via pin
- Torsion spring to avoid noise



- Cable reel allows tension across full rotation range

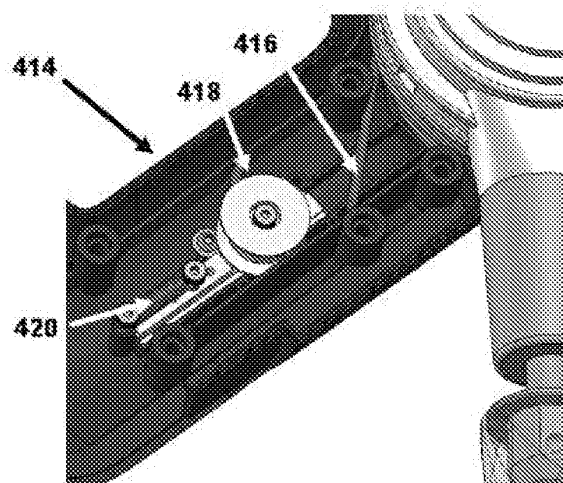
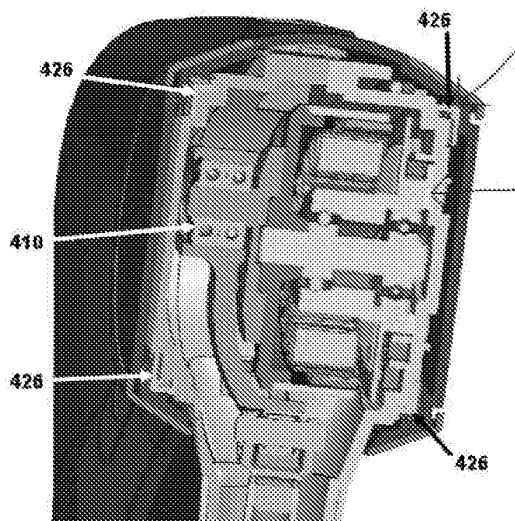


FIG. 36

G4 Pro dual vibration isolation

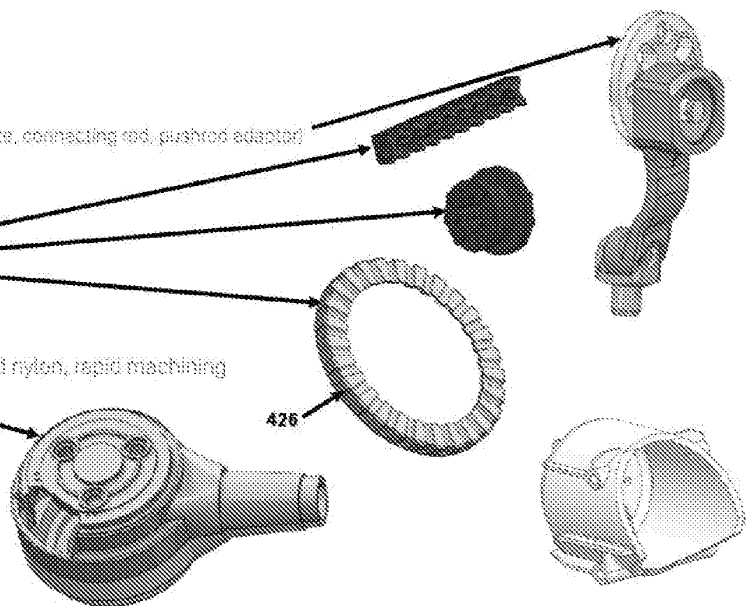
- Puck from housing
- Motor from puck
- Multiple durometers to test, including stiff

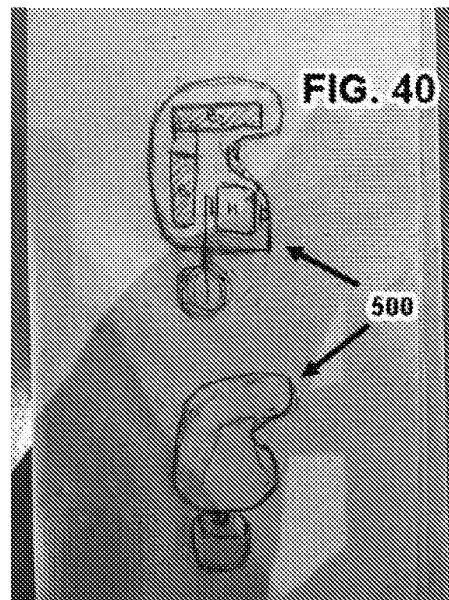
FIG. 37

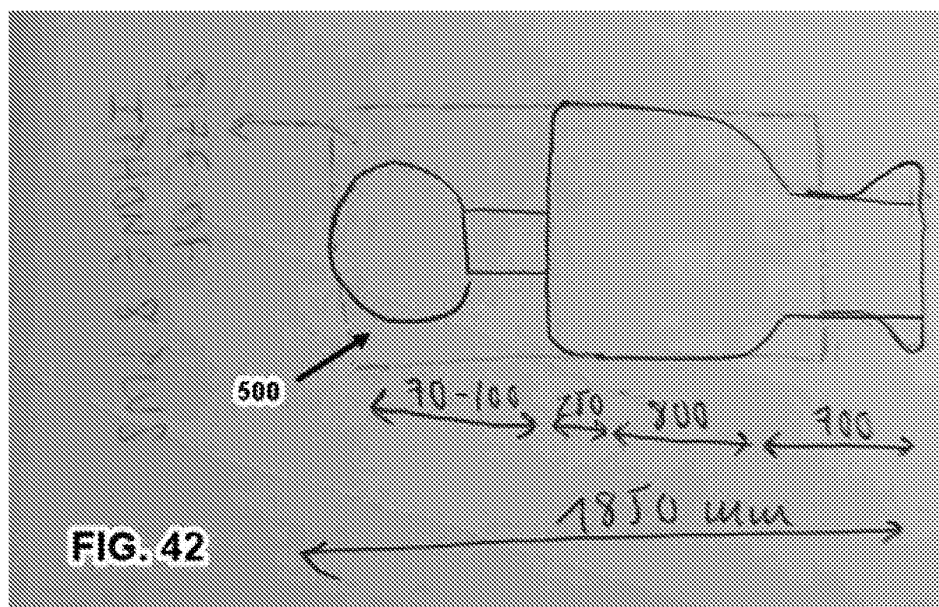
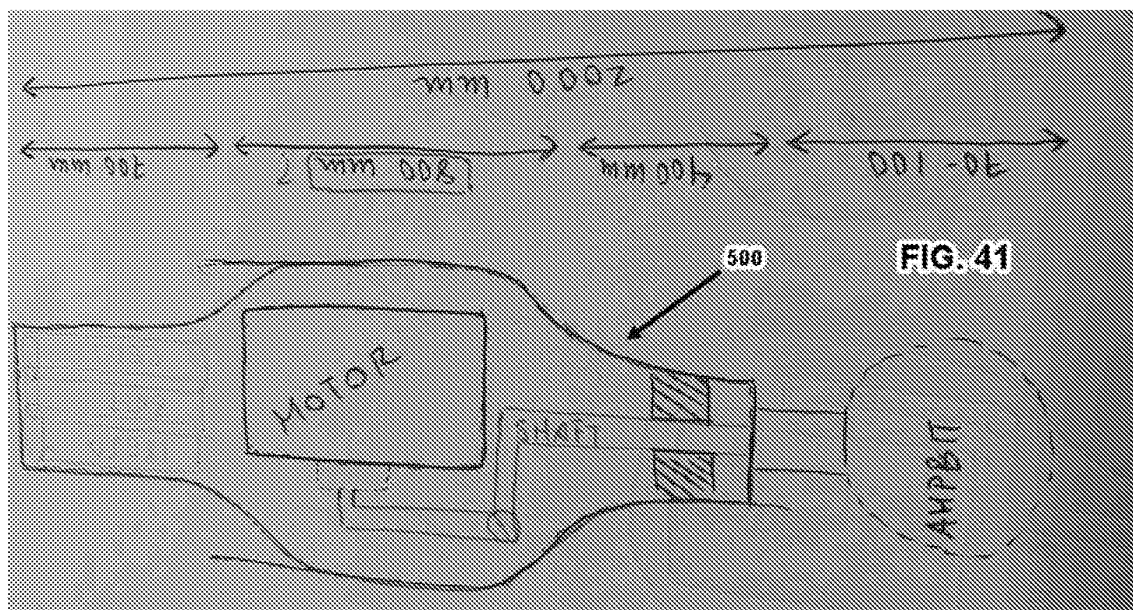


- Machined drive train parts
 - 1x G4 Pro drive train (motor pin plate, connecting rod, pushrod adaptor)
- Elastomer parts
- Motor housings – 50% glass filled nylon, rapid machining
 - G4 Pro puck clamshell

FIG. 38







Electronic Patent Application Fee Transmittal				
Application Number:				
Filing Date:				
Title of Invention:		PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE		
First Named Inventor/Applicant Name:		Jason Wersland		
Filer:		Brennan C. Swain/Sharon Duncan		
Attorney Docket Number:		76840-5036		
Filed as Small Entity				
Filing Fees for Provisional				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
PROVISIONAL APPLICATION FILING FEE	2005	1	140	140
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 (\$)				140

Electronic Acknowledgement Receipt	
EFS ID:	35942329
Application Number:	62844424
International Application Number:	
Confirmation Number:	5923
Title of Invention:	PERCUSSIVE MASSAGE DEVICE AND METHOD OF USE
First Named Inventor/Applicant Name:	Jason Wersland
Customer Number:	24574
Filer:	Brennan C. Swain/Sharon Duncan
Filer Authorized By:	Brennan C. Swain
Attorney Docket Number:	76840-5036
Receipt Date:	07-MAY-2019
Filing Date:	
Time Stamp:	15:58:22
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	\$140
RAM confirmation Number	050819INTEFSW00002819100440
Deposit Account	100440
Authorized User	Sharon Duncan
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows: 37 CFR 1.16 (National application filing, search, and examination fees) 37 CFR 1.17 (Patent application and reexamination processing fees)	

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Provisional Cover Sheet (SB16)	76840_5036_Prov_Cvr.pdf	2048359	no	4
			9c5f2ccab967d8fa228c4967d3cb2e18e9d07239		
Warnings:					
Information:					
2	Specification	76840_5036_Specification.pdf	222561	no	33
			818c34d538588a4fd03f65ebde259c7b4fe65036		
Warnings:					
Information:					
3	Drawings-other than black and white line drawings	76840_5036_Drawings1.pdf	2412886	no	37
			1e80ff803257a7855ae28f58293e2e91a4f2e2c2		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30056	no	2
			2372865ddd15e4f6dc3dce1d581cd44e818bc46a		
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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.