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CORRESPONDENCE ADDRESS CHANGE

APPLICATION #	FILING OR 371(C) DATE	REQUEST ID
62/797,866	01/28/2019	118131

The following fields have been changed to Customer Number 190265 on 10/20/2023 via Patent Center in view of the certification copied below that authorized the change.

- Correspondence Address

The address for Customer Number 190265 is:

190265 - Nixon Peabody (DJO)
70 West Madison
Suite 5200
Chicago , IL 60602

I certify, in accordance with 37 CFR 1.4(d)(4), that I am :

An attorney or Agent of Record registered to practice before the Patent and Trademark Office who has been given power of attorney in this application

Signature	**Name**	**Registration #**
/Bradley M. Taub, Reg. No. 67,300/	Bradley Taub	67300

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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
62/797,866	01/28/2019		680	294564-001011PL01		

CONFIRMATION NO. 7468

FILING RECEIPT

70001
NIXON PEABODY LLP
70 West Madison Street, Suite 3500
CHICAGO, IL 60602

OC000000105803012

Date Mailed: 02/05/2019

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

Inventor(s)

Mark A. Frankle, Tampa, FL;
Sergio Gutierrez, Tampa, FL;
Gerald Williams, Tampa, FL;

Applicant(s)

ENCORE MEDICAL L.P. (D/B/A DJO SURGICAL), Austin, TX;

Power of Attorney:
Bradley Taub--67300

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

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

If Required, Foreign Filing License Granted: 02/04/2019

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 62/797,866**

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

Non-Publication Request: No

Early Publication Request: No

Title

GLENOID IMPLANT

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 AssetsControl, 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.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

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

Secrecy Order 37 CFR 5.2:

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

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark	A.	Frankle	

Residence Information (Select One) ● US Residency Non US Residency Active US Military Service

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	915 Mooring Circle		
Address 2			
City	Tampa	State/Province	FL
Postal Code	33602	Country	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Sergio		Gutierrez	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	915 Mooring Circle		
Address 2			
City	Tampa	State/Province	FL
Postal Code	33602	Country	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Gerald		Williams	

Residence Information (Select One) ◉ US Residency Non US Residency Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

City	Tampa	State/Province	FL	Country of Residence	US

Mailing Address of Inventor:

Address 1	915 Mooring Circle		
Address 2			
City	Tampa	State/Province	FL
Postal Code	33602	Country	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

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

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

Customer Number	70001		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	GLENOID IMPLANT		
Attorney Docket Number	294564-001011PL01	Small Entity Status Claimed	☐
Application Type	Provisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)	76	Suggested Figure for Publication (if any)	

Filing By Reference:

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

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

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

Publication Information:

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

Representative Information:

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

Please Select One:	● Customer Number	US Patent Practitioner	◯ Limited Recognition (37 CFR 11.9)
Customer Number	70001		

Domestic Benefit/National Stage Information:

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

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing or 371(c) Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

Foreign Priority Information:

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

Remove

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

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

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

Authorization or Opt-Out of Authorization to Permit Access:

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

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

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

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

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

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

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

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

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

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

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

Applicant Information:

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

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

● Assignee	Legal Representative under 35 U.S.C. 117	Joint Inventor
Person to whom the inventor is obligated to assign.	Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor:

If the Applicant is an Organization check here. ☒

Organization Name	ENCORE MEDICAL L.P. (D/B/A DJO SURGICAL)		
Mailing Address Information For Applicant:			
Address 1	9800 Metric Boulevard		
Address 2			
City	Austin	**State/Province**	TX
Country	US	Postal Code	78758
Phone Number		Fax Number	
Email Address			

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

Assignee Information including Non-Applicant Assignee Information:

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

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

Assignee 1

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

Remove

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

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

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

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

Signature:

Remove

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

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

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

Signature	/Bradley M. Taub/			Date (YYYY-MM-DD)	2019-01-28
First Name	Bradley	Last Name	Taub	Registration Number	67300

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

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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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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	294564-001011PL01
	Application Number	
Title of Invention	GLENOID IMPLANT	

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

Privacy Act Statement

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

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

1 The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these records.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3 A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent CooperationTreaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

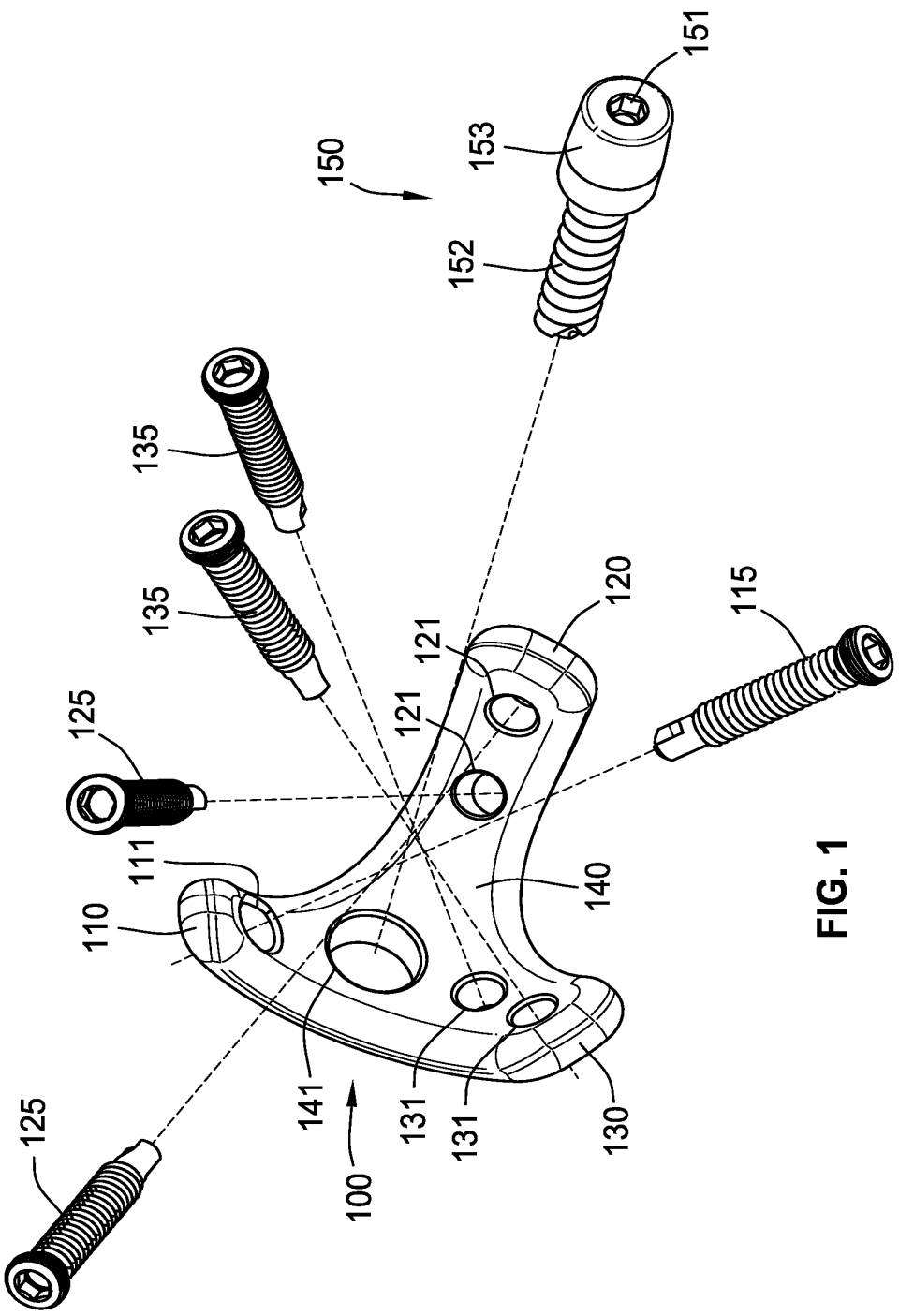

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FIG. 1

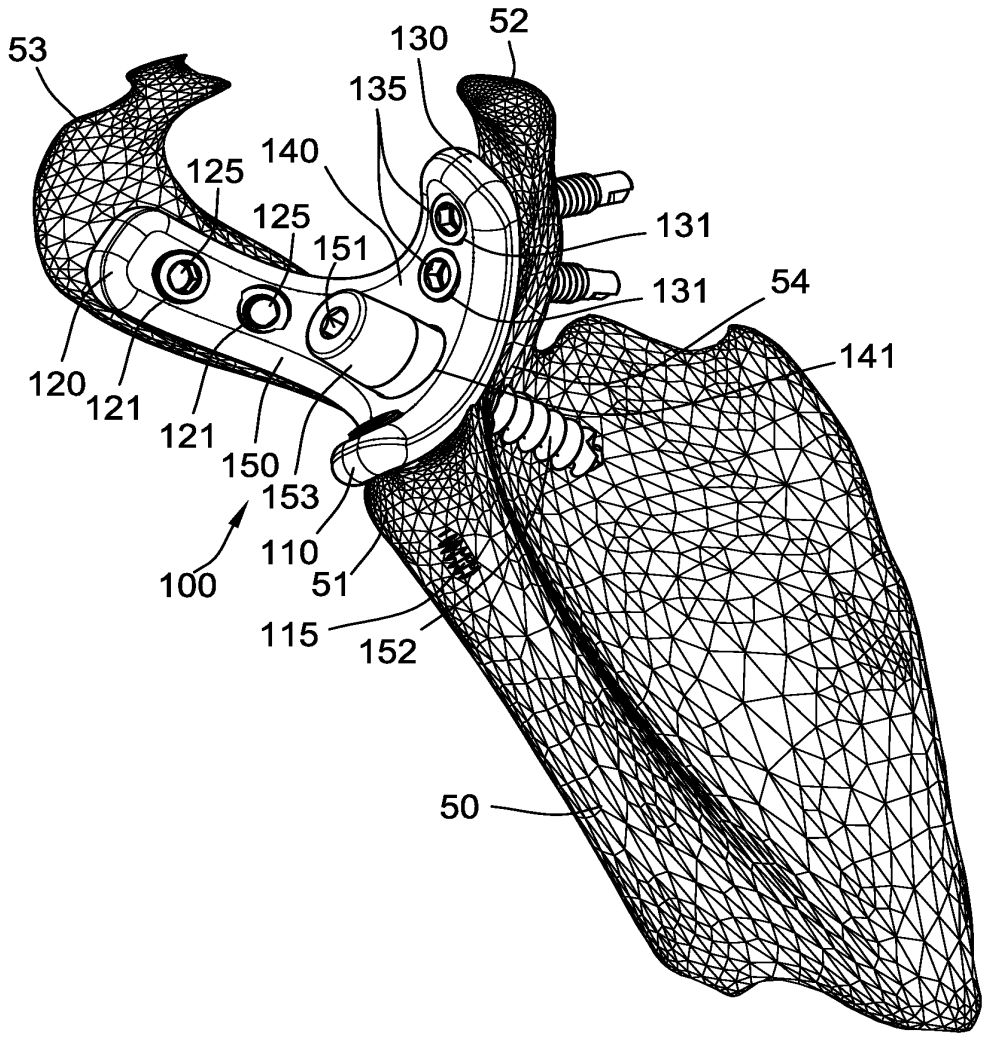

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121
150
153
110
100
51
115
152
50

FIG. 2

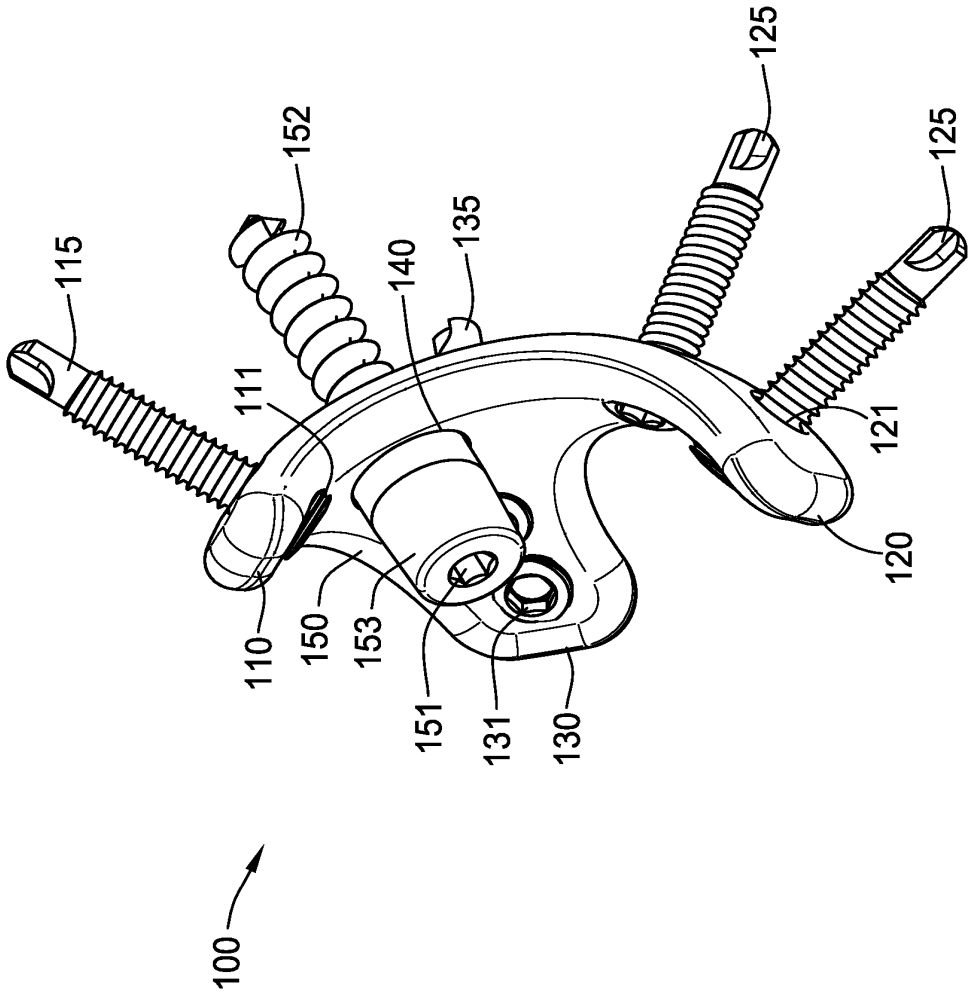


FIG. 3

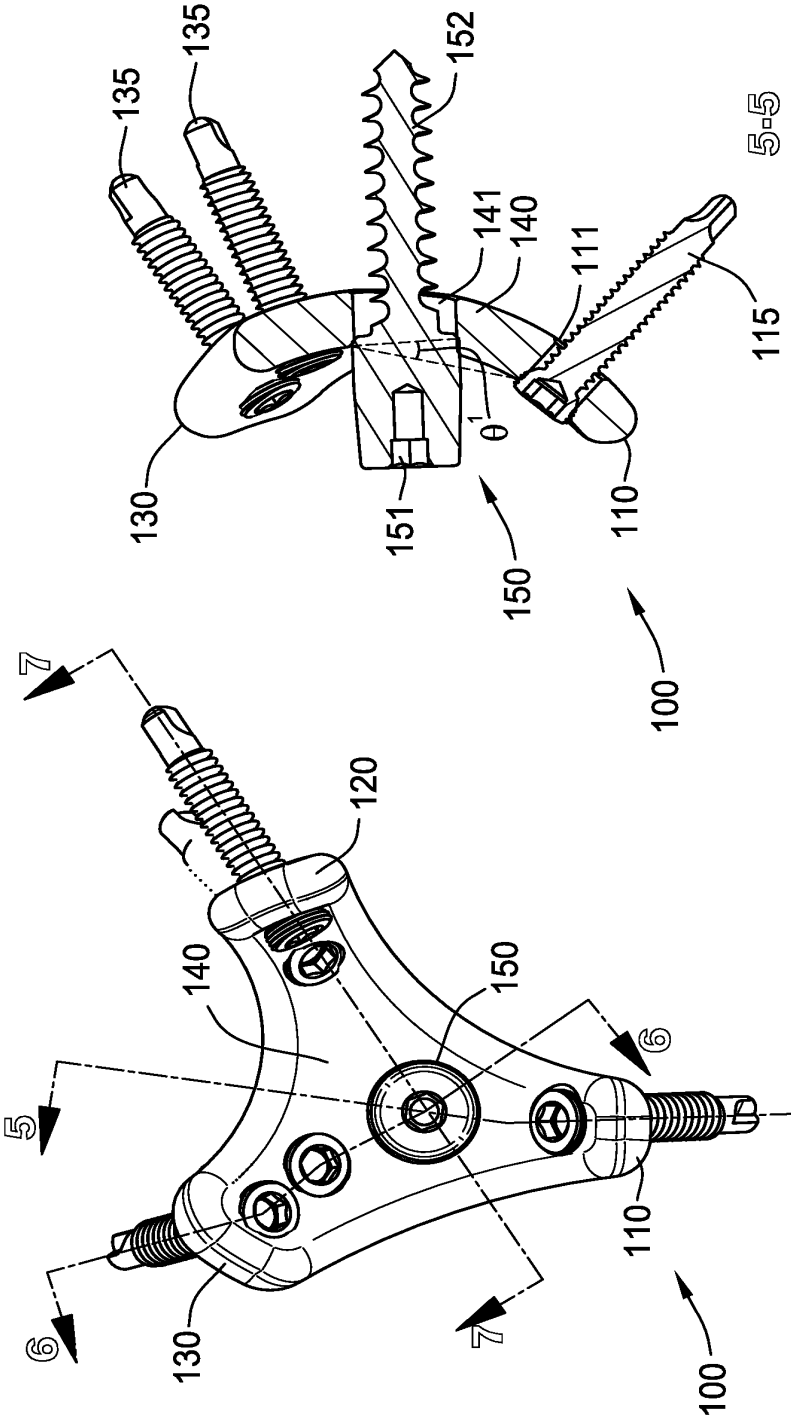

135
135
152
5-5
141
140
111
115
130
θ1
151
150
110
100
7
120
140
150
6
5
5
6
130
110
7
100

FIG. 5

FIG. 4

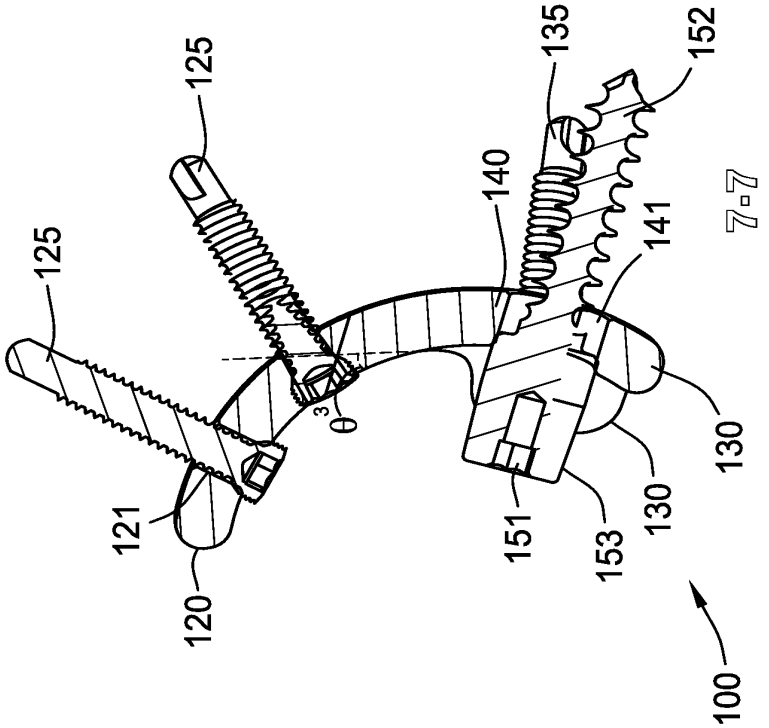

125
125
121
120
θ3
140
135
152
141
7-7
151
153
130
130
100

FIG. 7

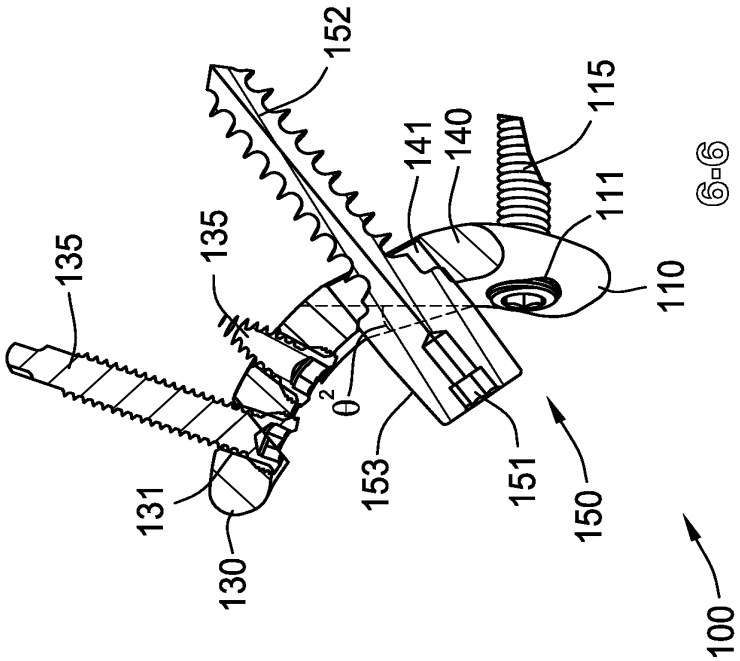

152
141
140
115
135
135
111
6-6
θ2
110
131
153
151
150
130
100

FIG. 6

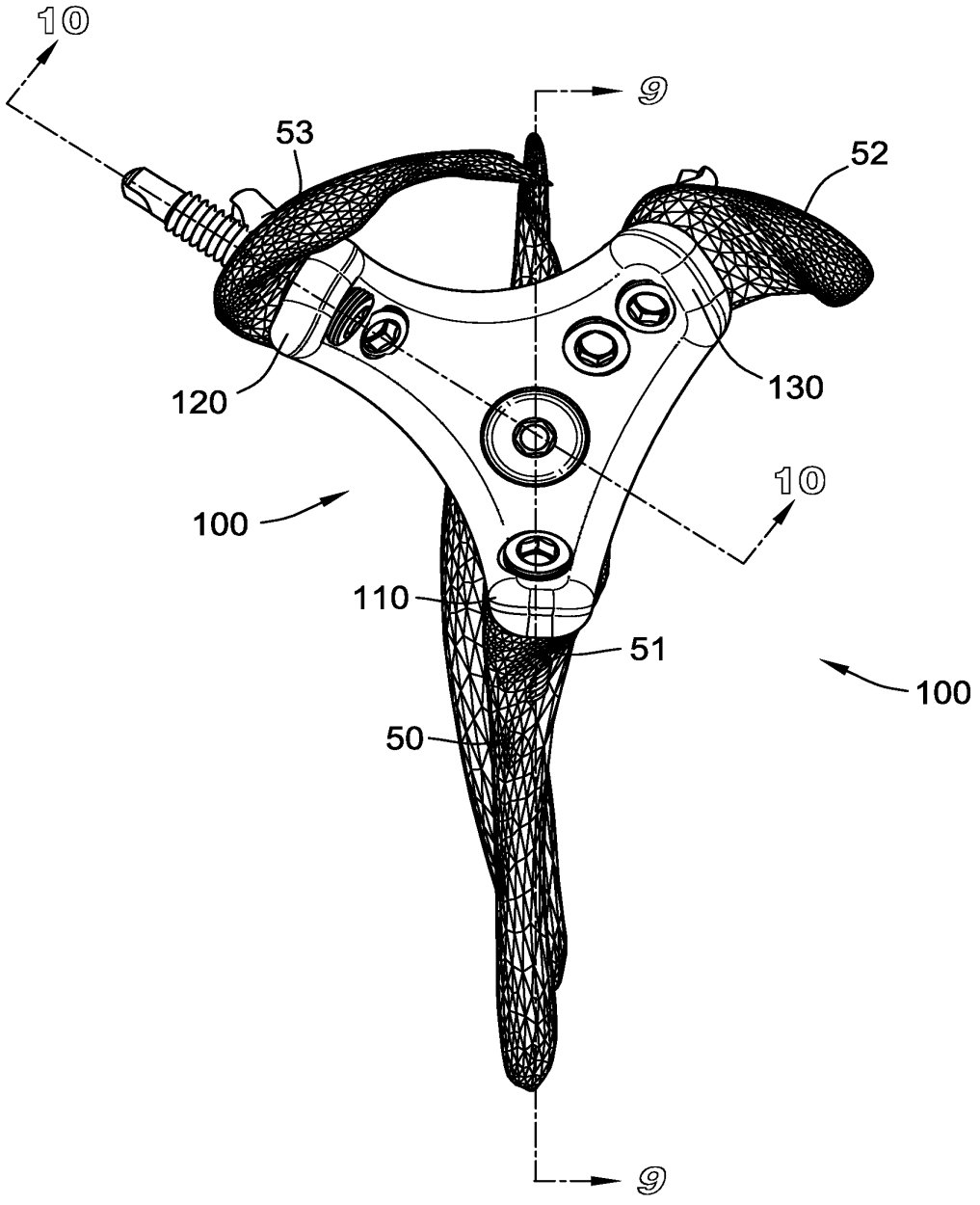


FIG. 8

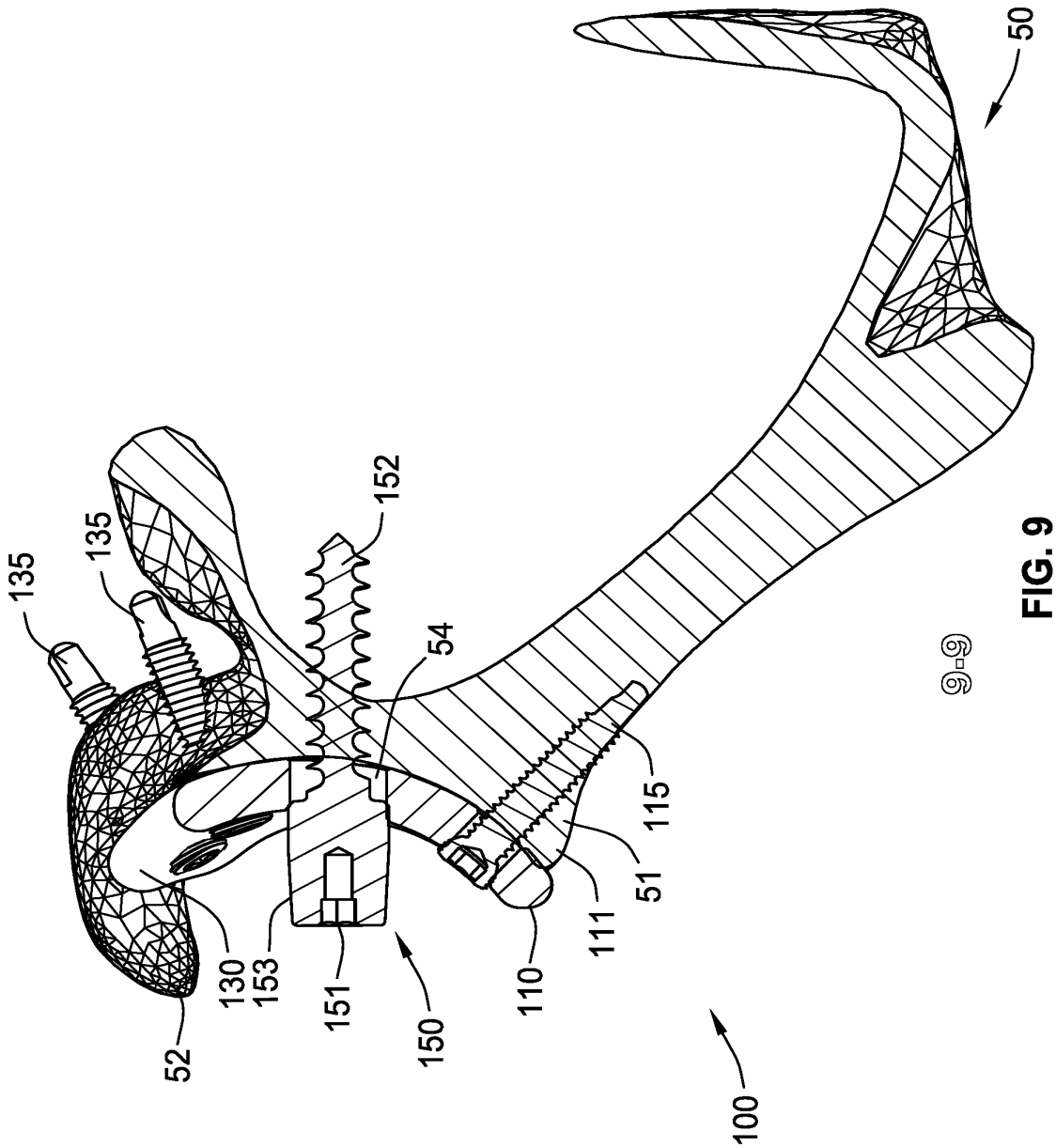


FIG. 9

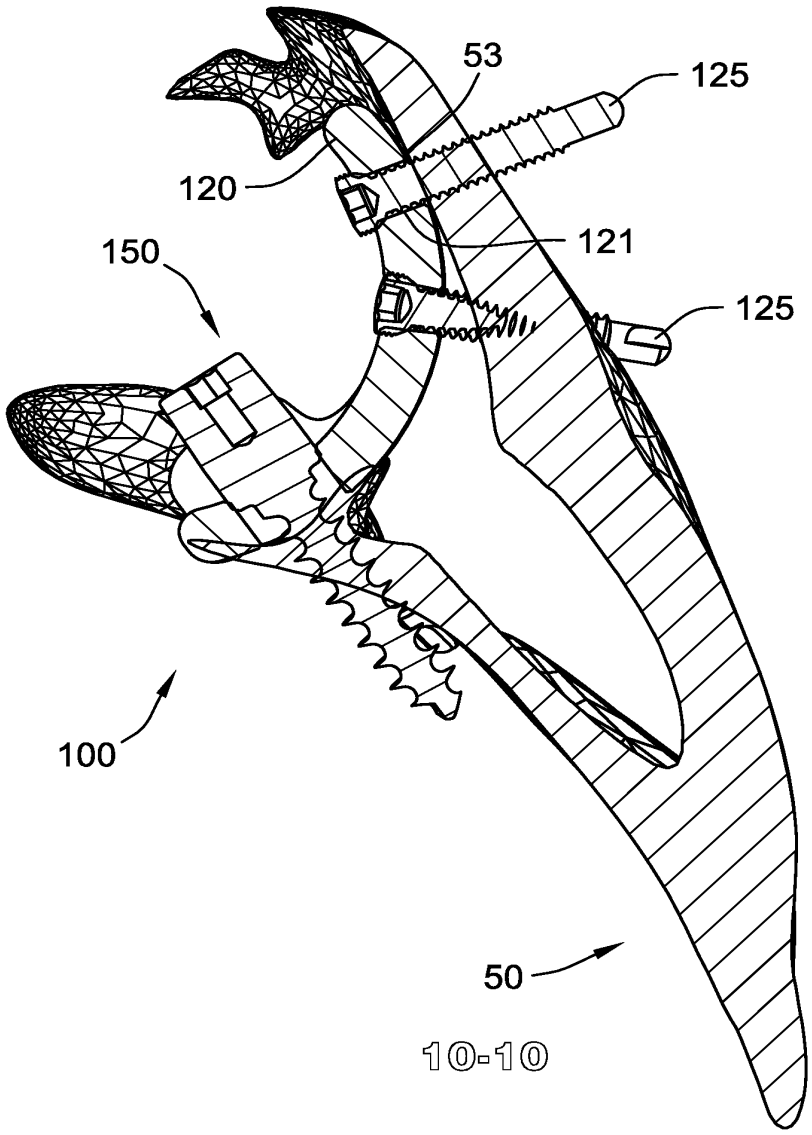


FIG. 10

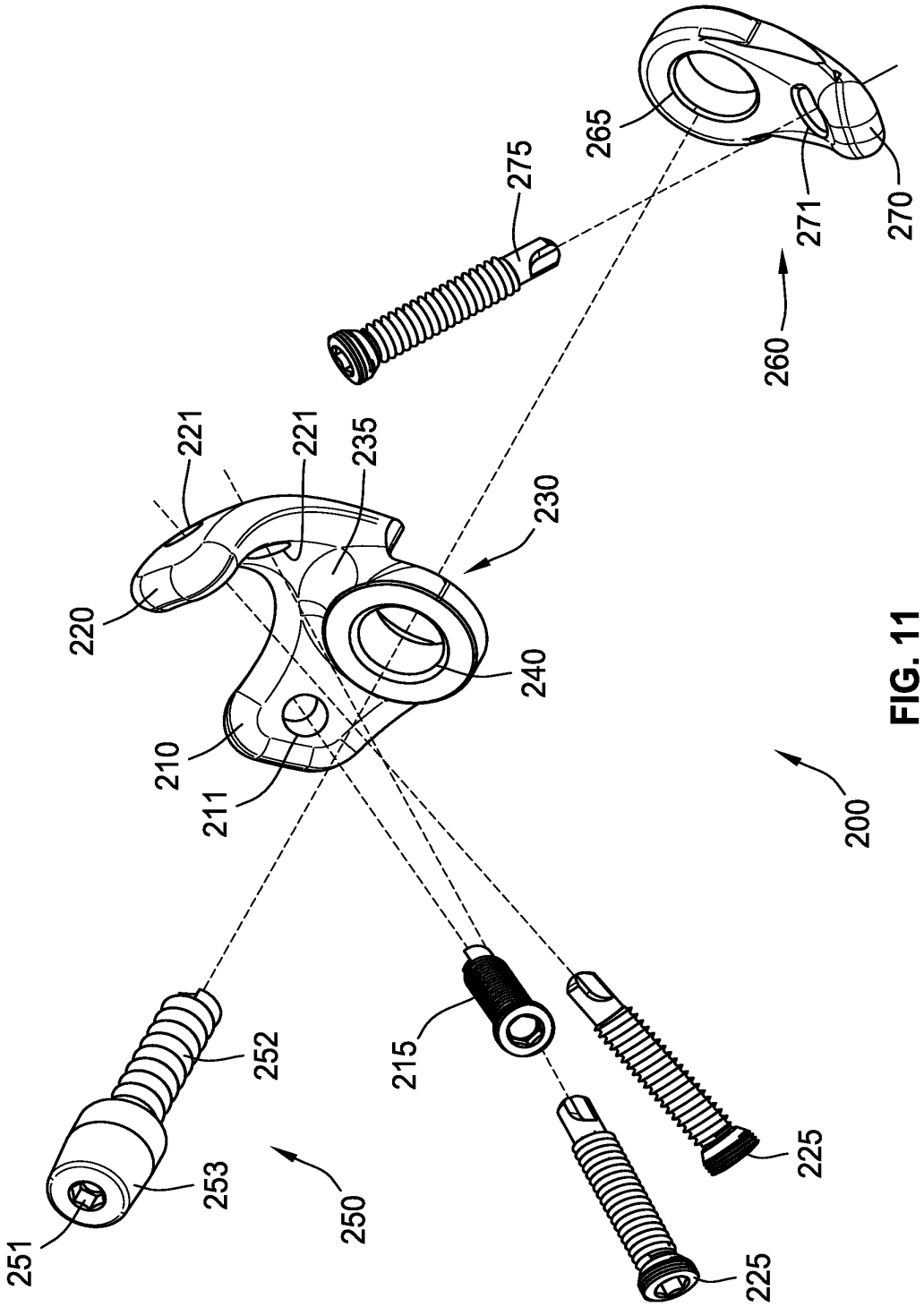

265
275
271
270
260
221
221
235
230
220
240
210
211
200
252
215
225
253
250
225
251

FIG. 11

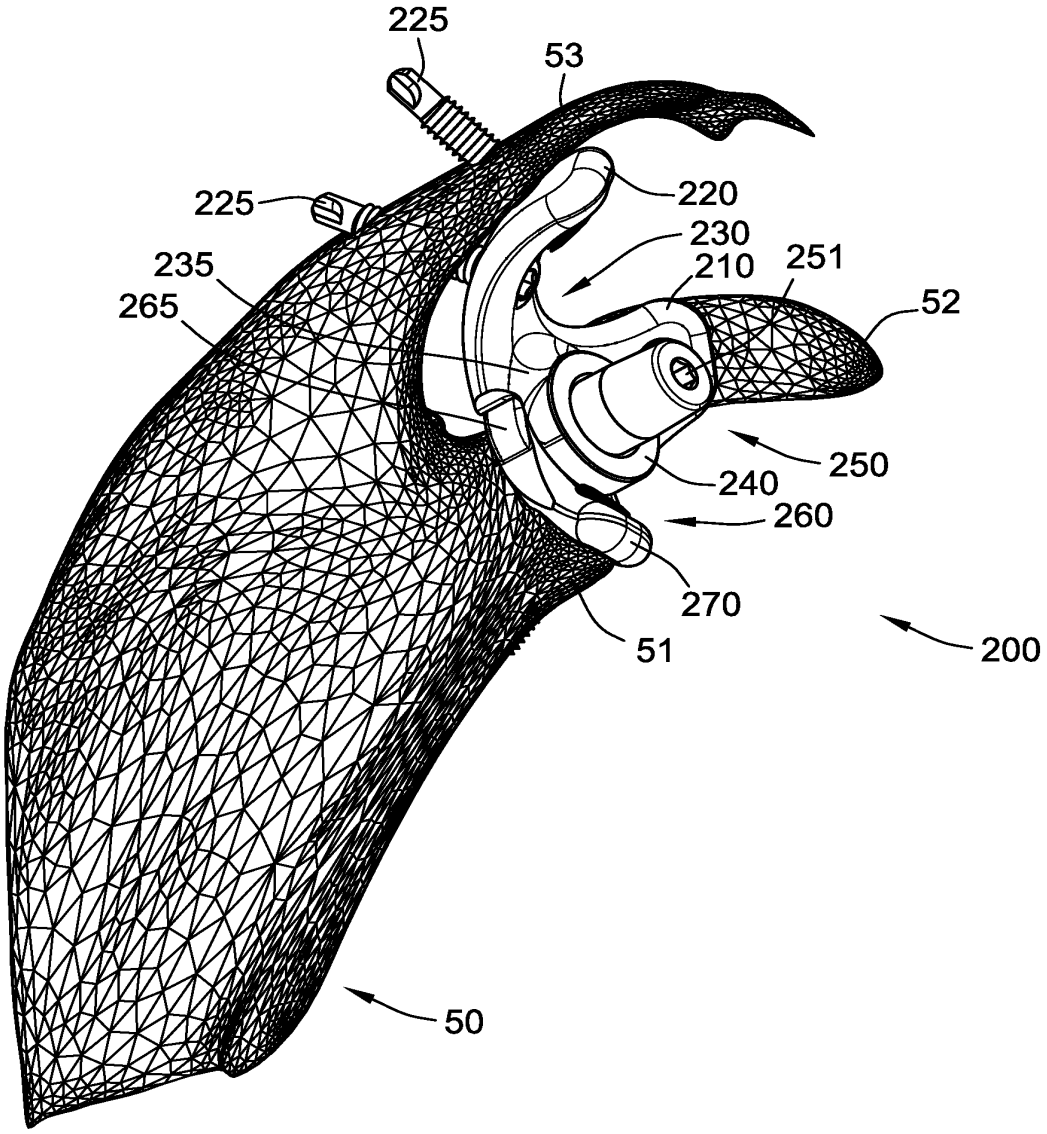


FIG. 12

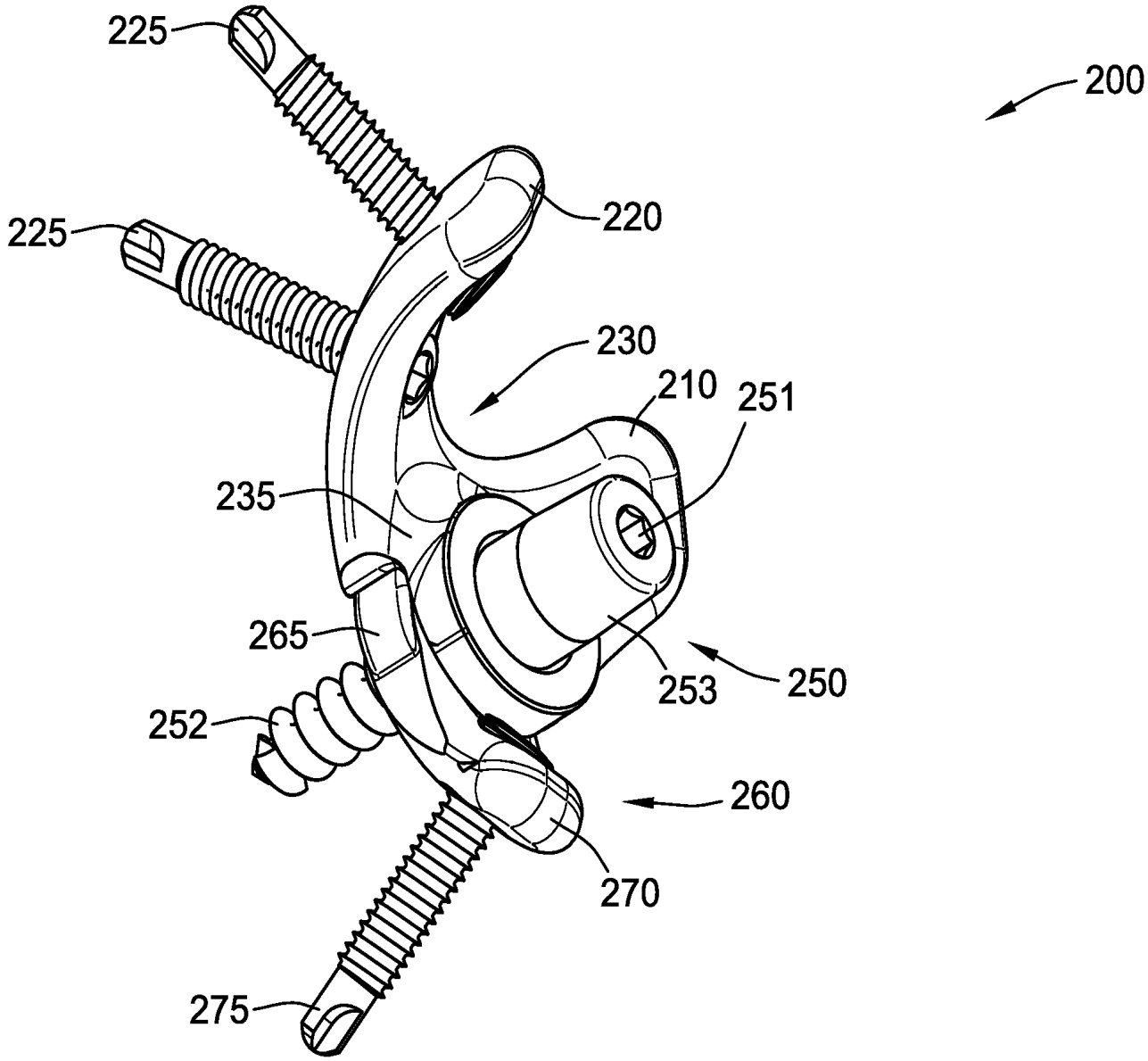


FIG. 13

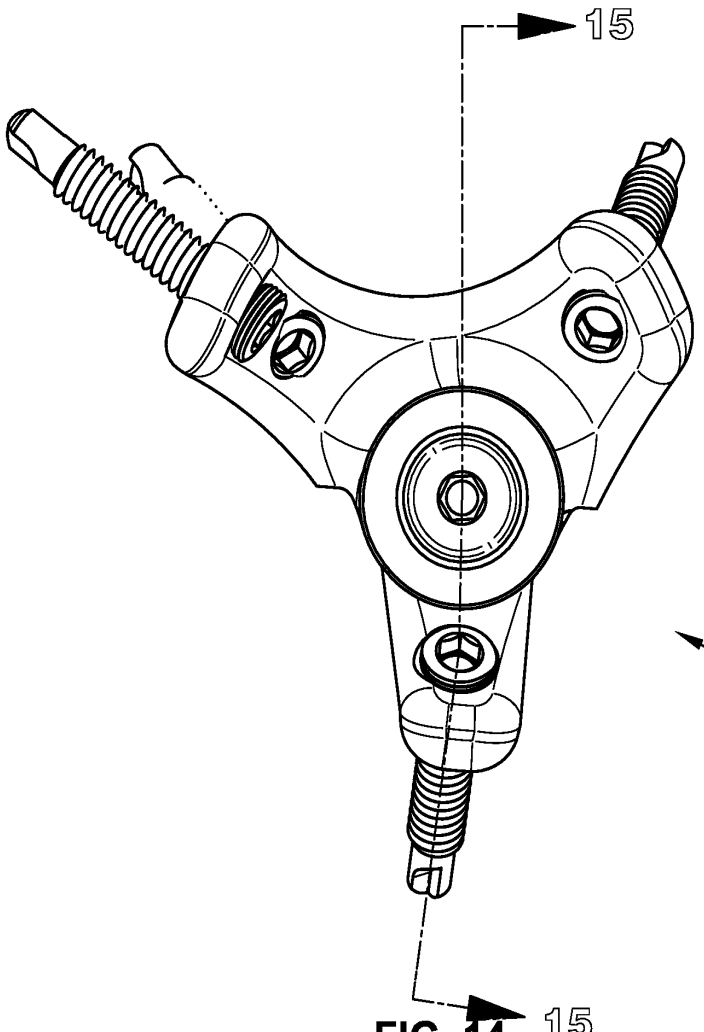


FIG. 14

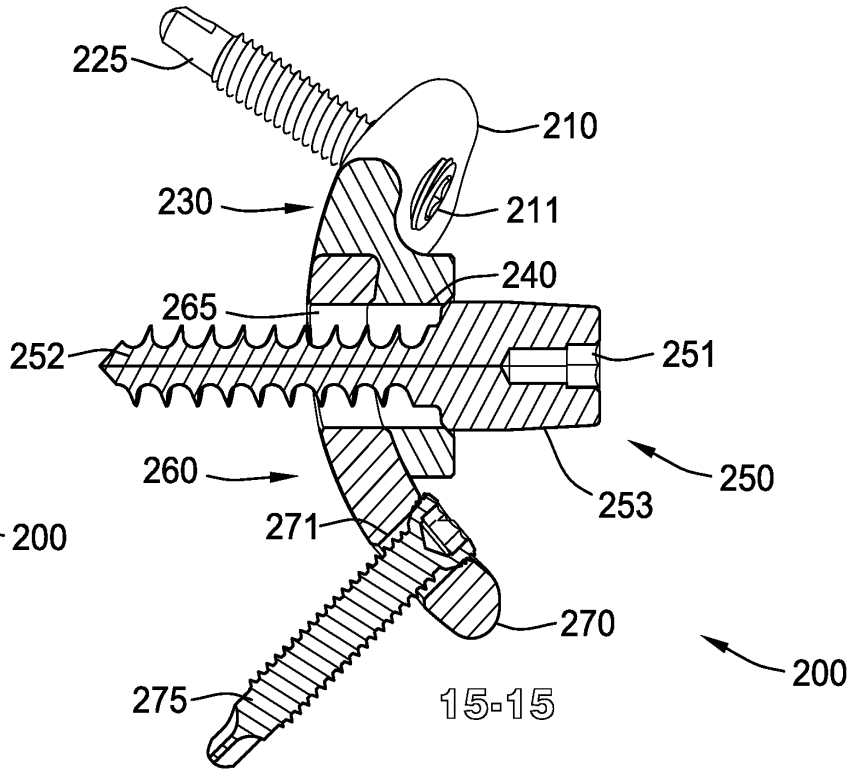


FIG. 15

CATALYST, EX-1025
PAGE 25

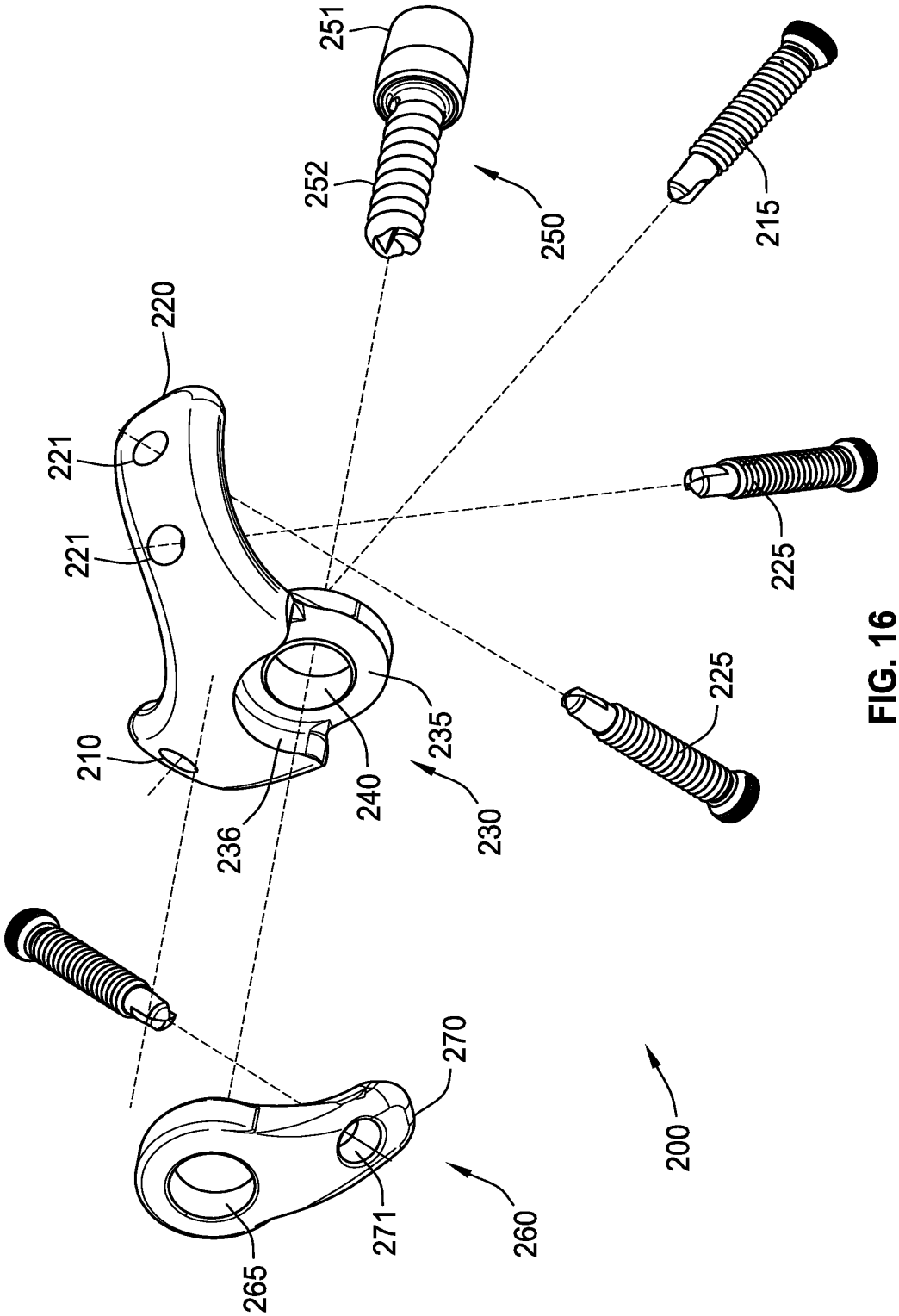

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250
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220
221
221
225
225
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236
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235
230
270
271
260
265
200

FIG. 16

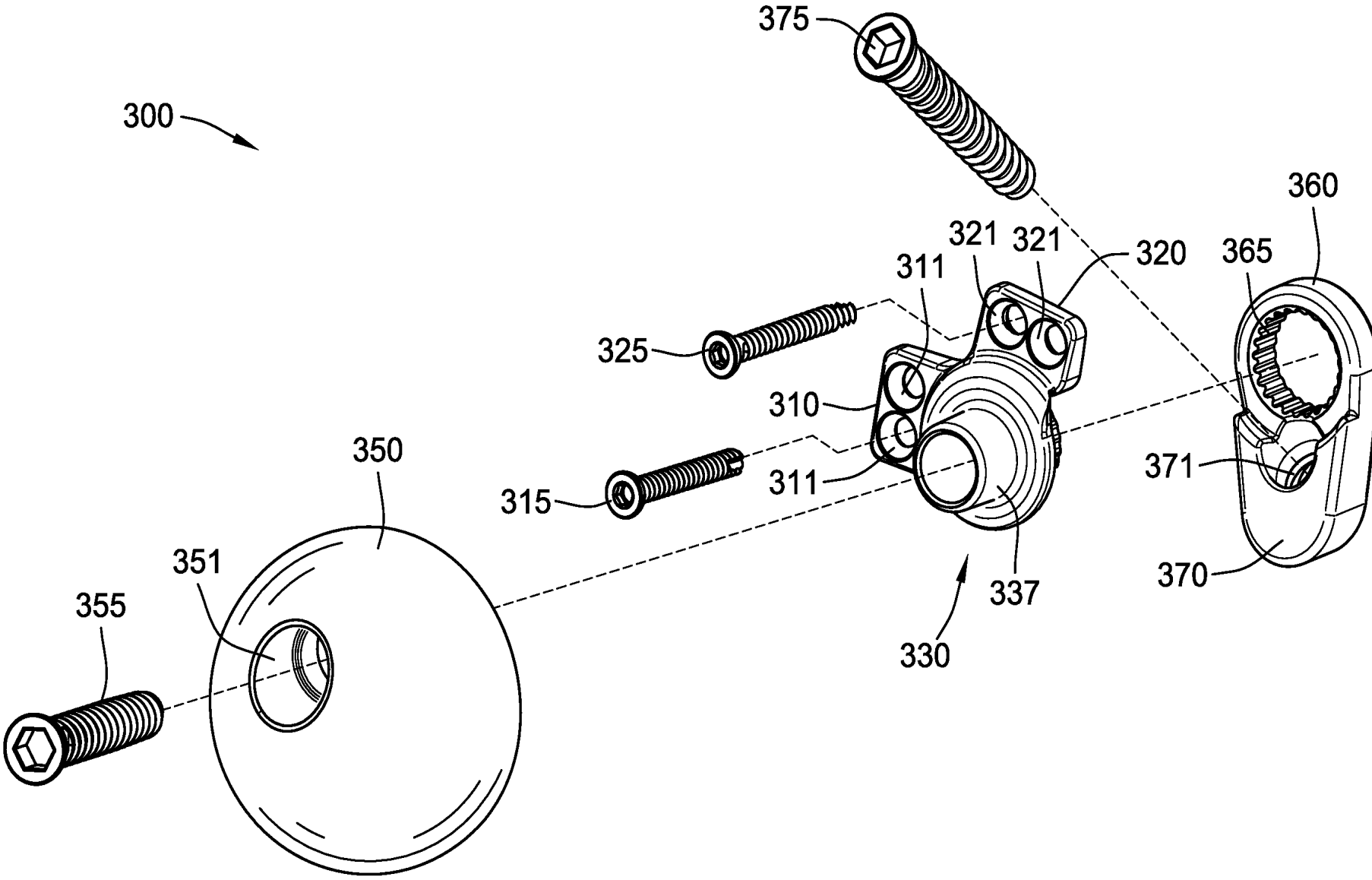

375
300
360
321
321
311
320
365
325
310
350
315
311
371
351
355
337
370
330

FIG. 17

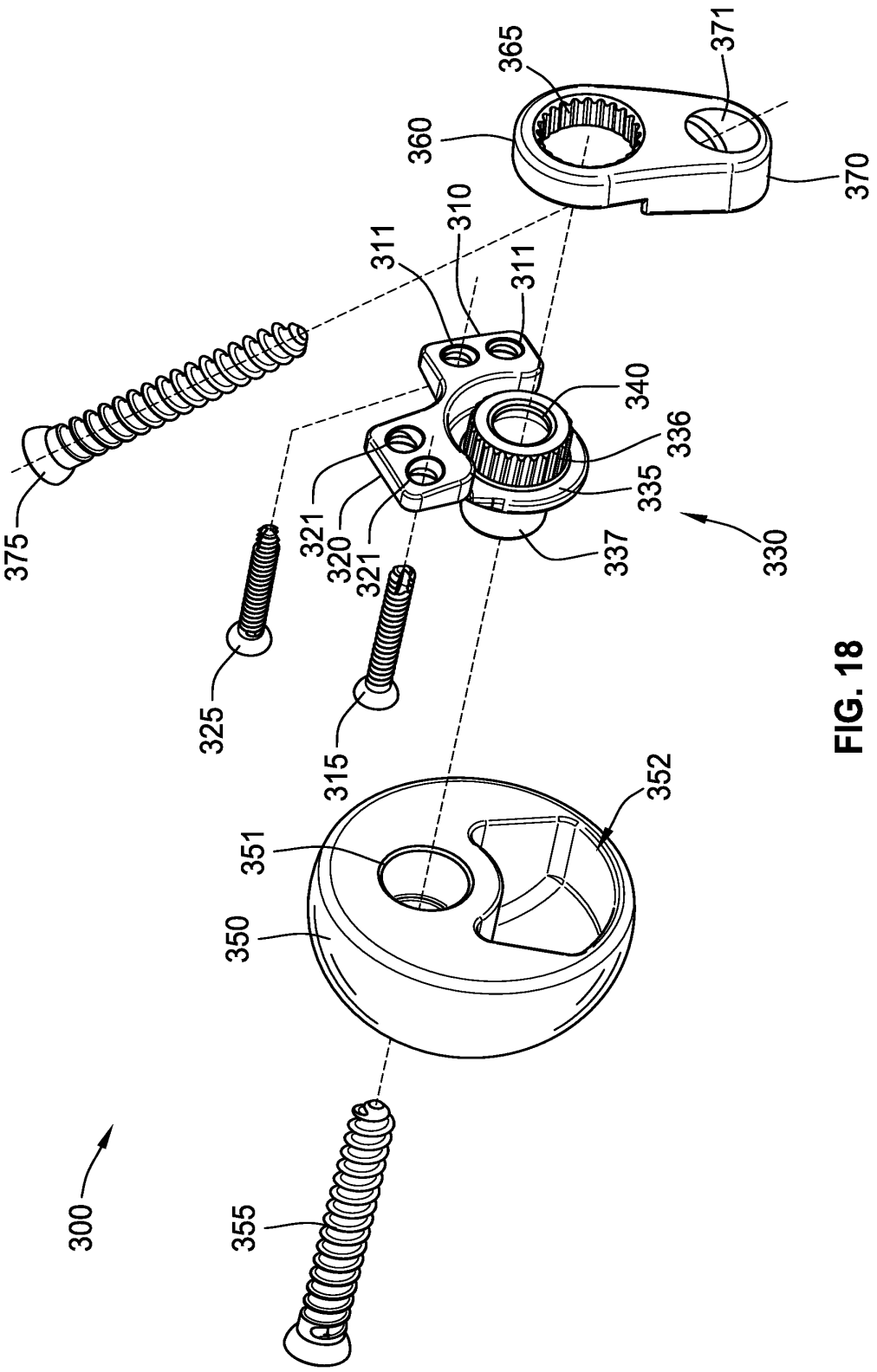

365
371
360
370
310
311
311
340
336
335
330
337
321
320
321
375
325
315
352
351
350
355
300

FIG. 18

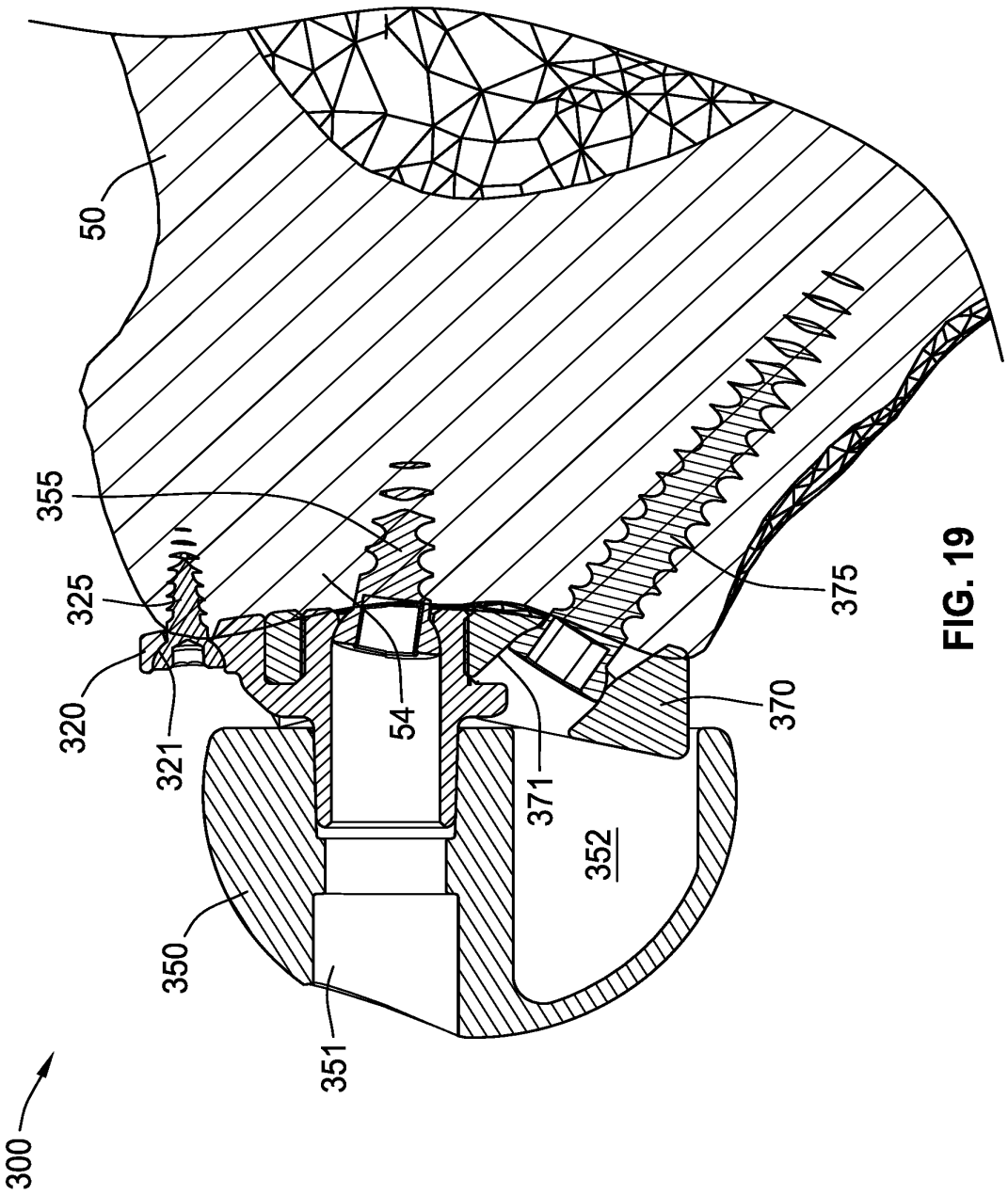


FIG. 19

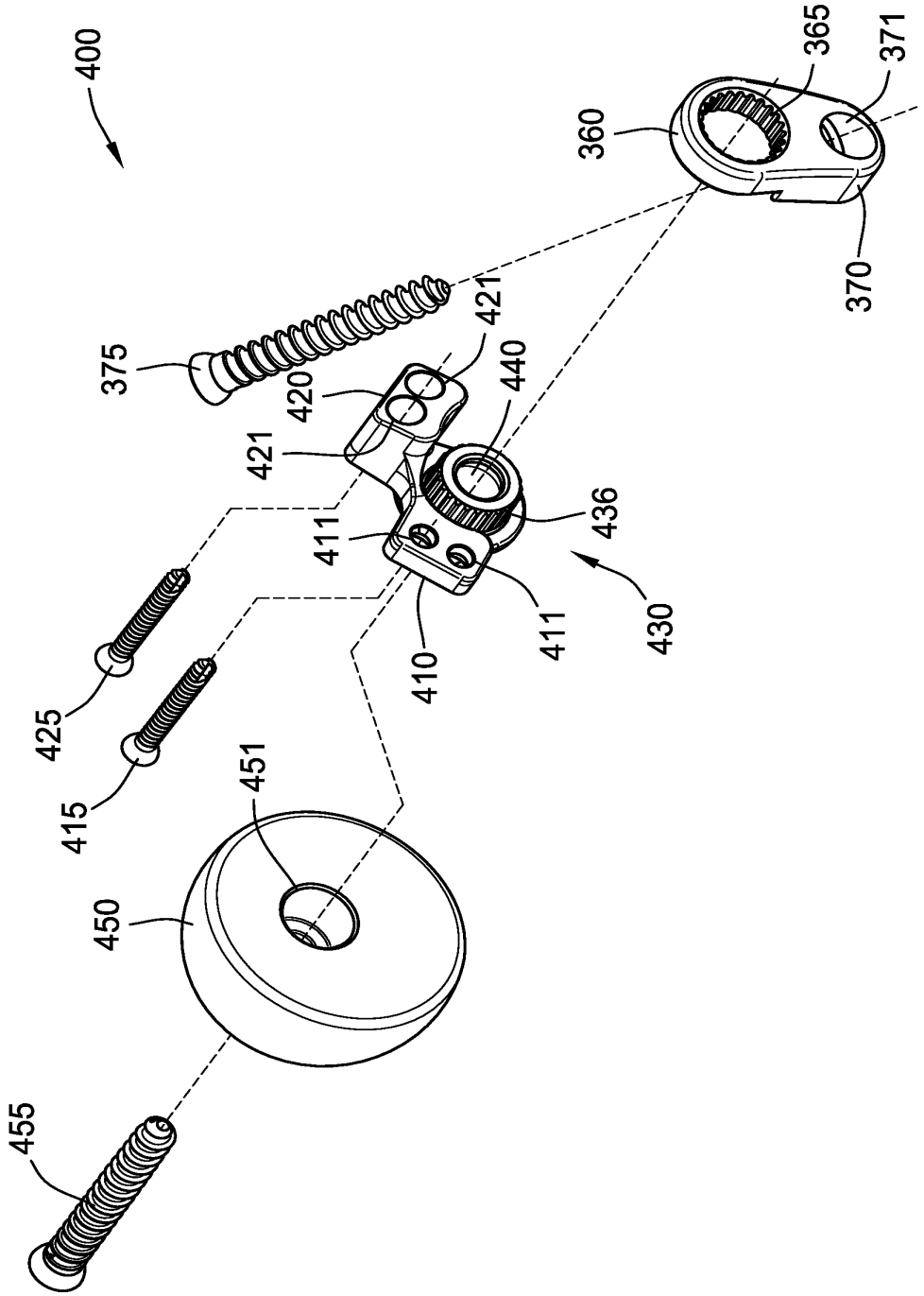

400
360
365
371
370
375
421
420
440
421
411
436
411
430
410
425
415
451
450
455

FIG. 20

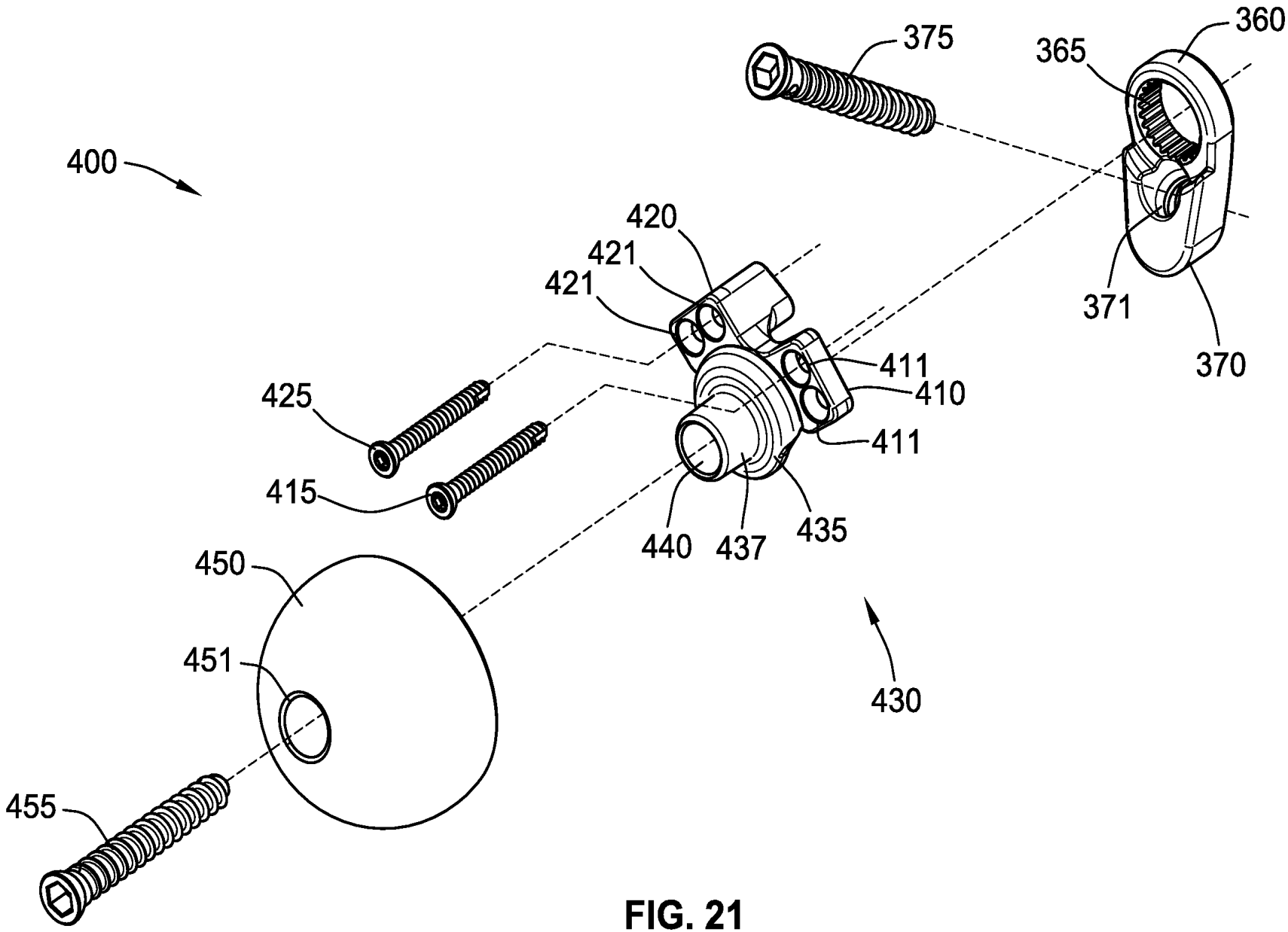

400
375
360
365
420
421
421
371
370
411
410
425
411
415
440
437
435
450
451
430
455

FIG. 21

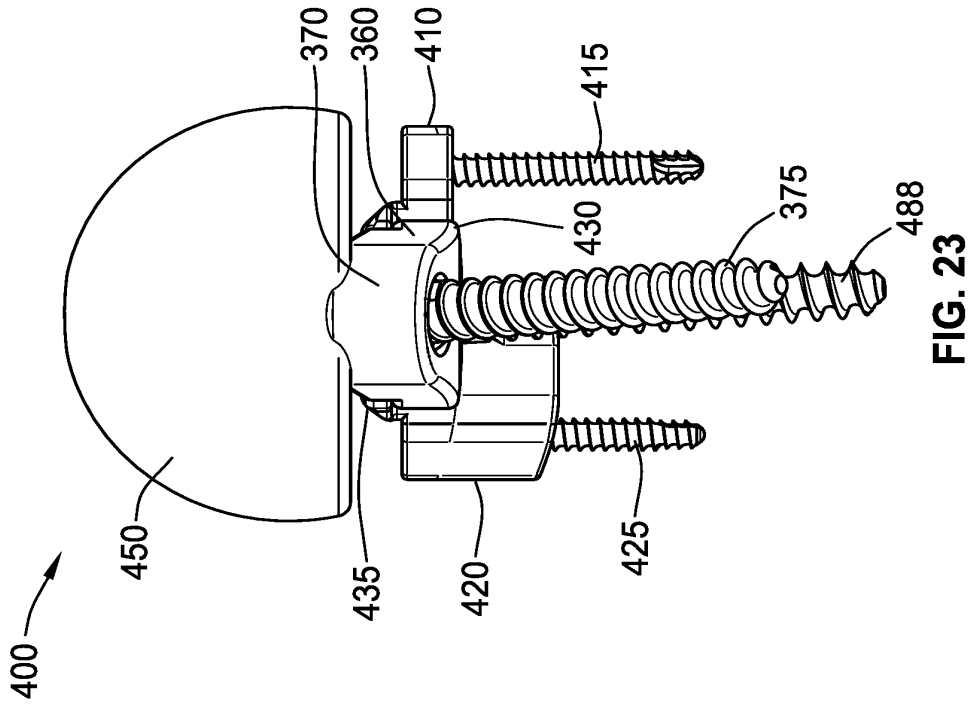

370
360
410
415
375
488
430
450
435
420
425
400

FIG. 23

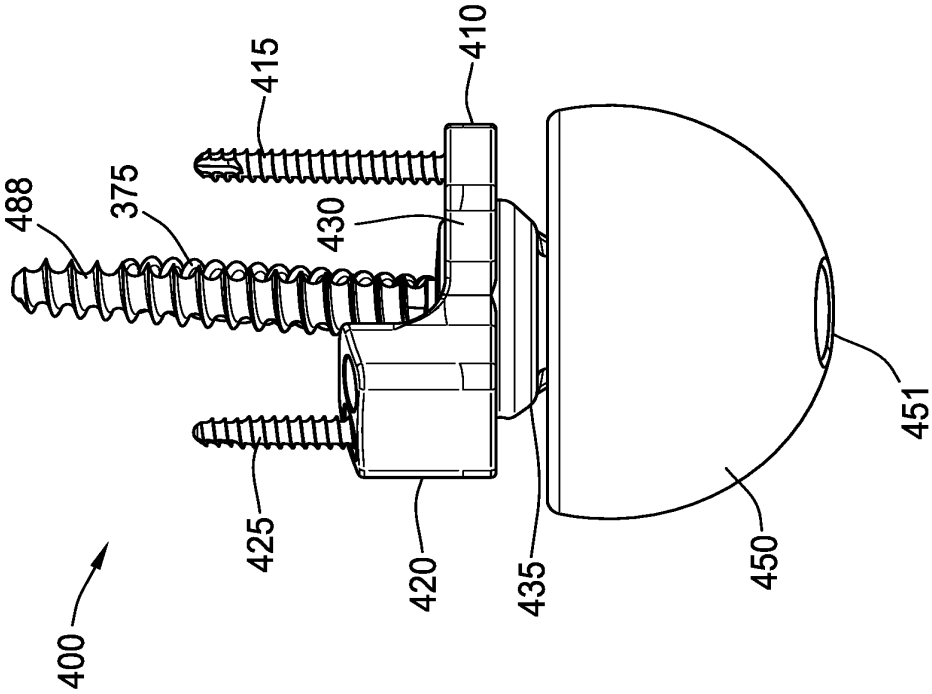

415
410
488
375
430
425
420
435
450
451
400

FIG. 22

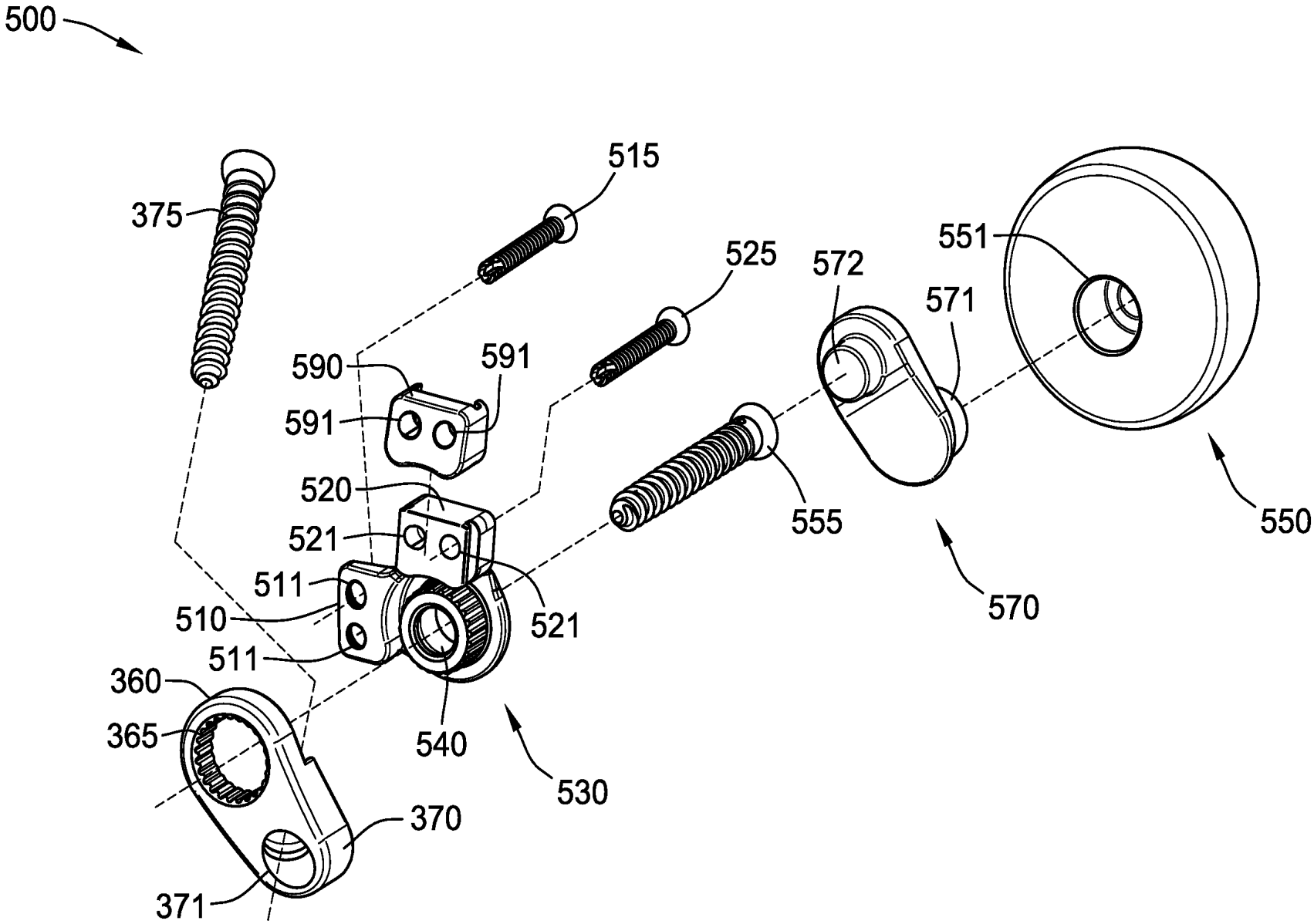

500
375
515
525
572
551
571
590
591
591
520
521
511
510
511
521
555
550
570
360
365
540
530
370
371

FIG. 24

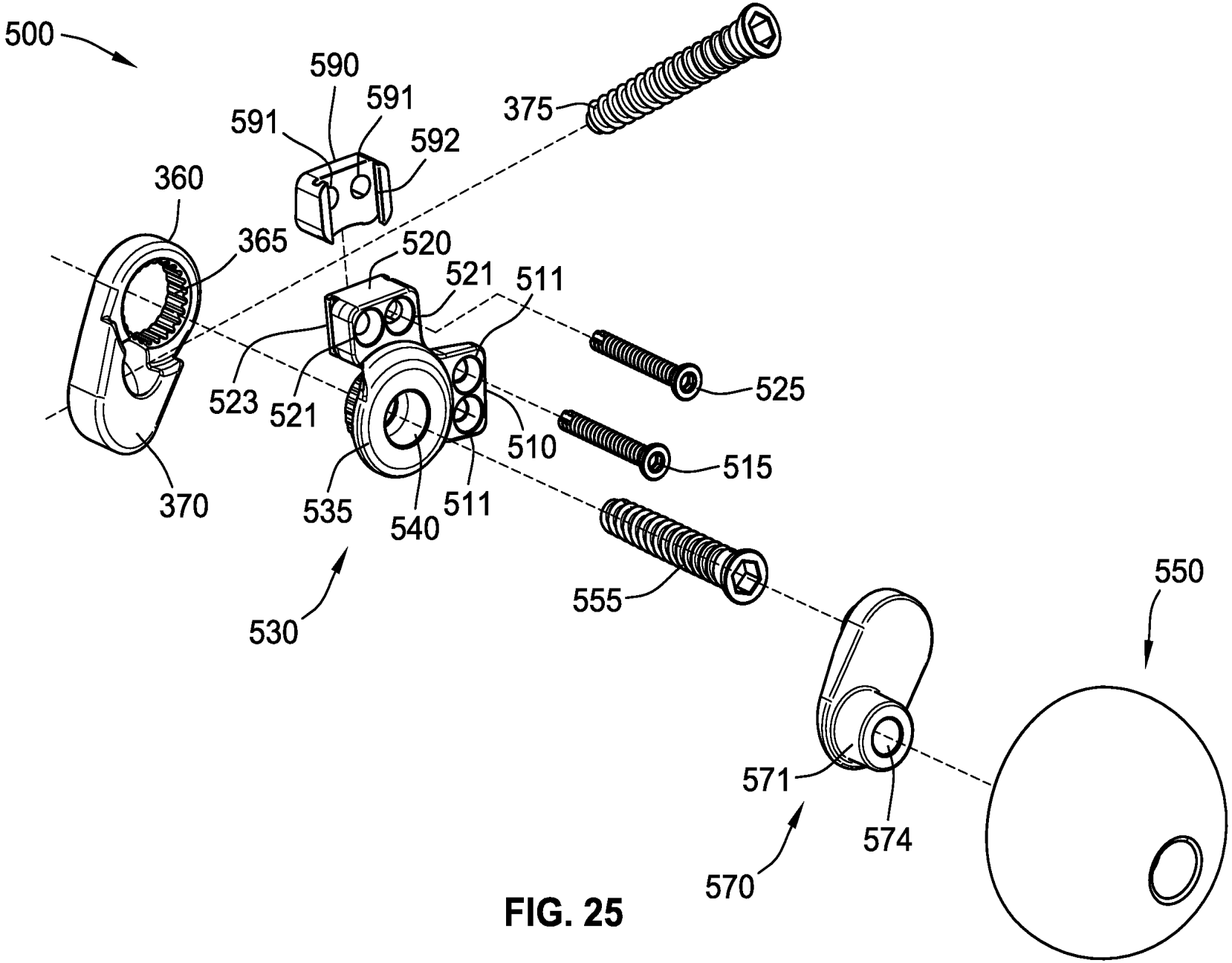

500
590
591
591
592
375
360
365
520
521
511
523
521
525
510
515
370
535
540
511
555
530
550
571
574
570

FIG. 25

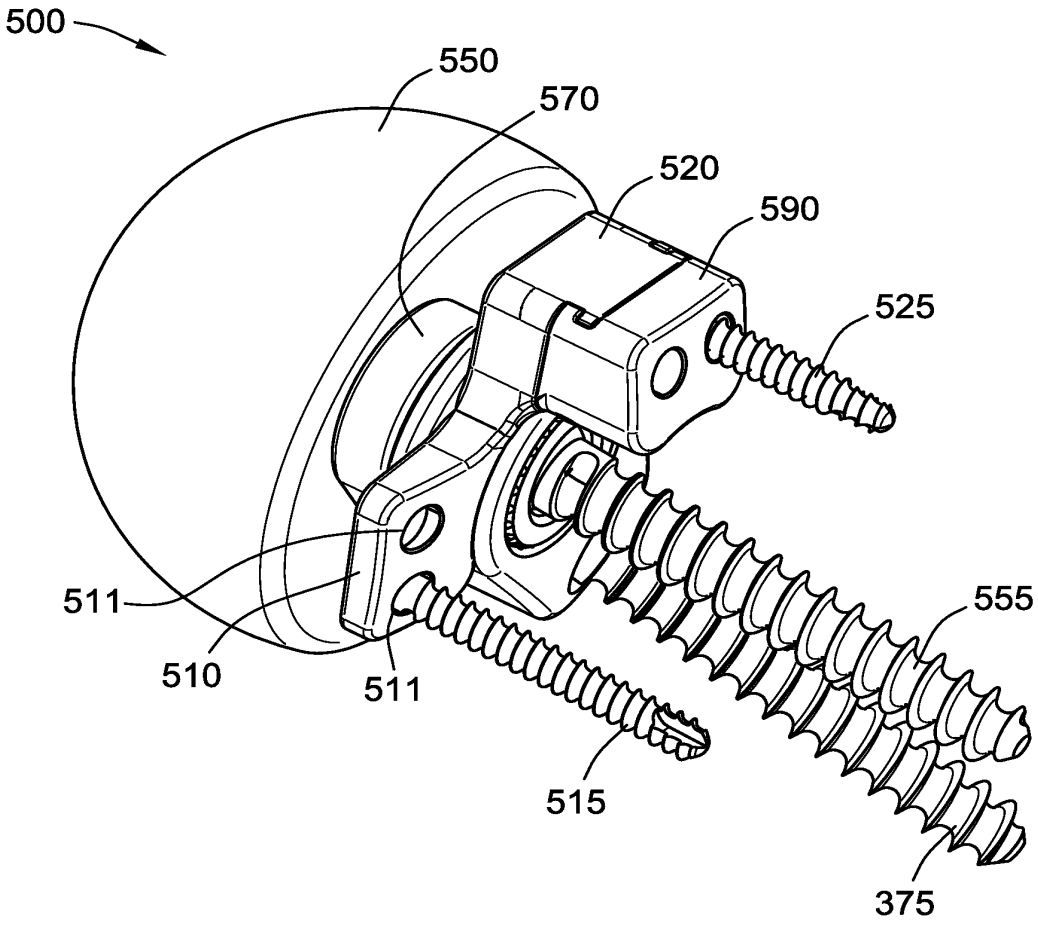


FIG. 26

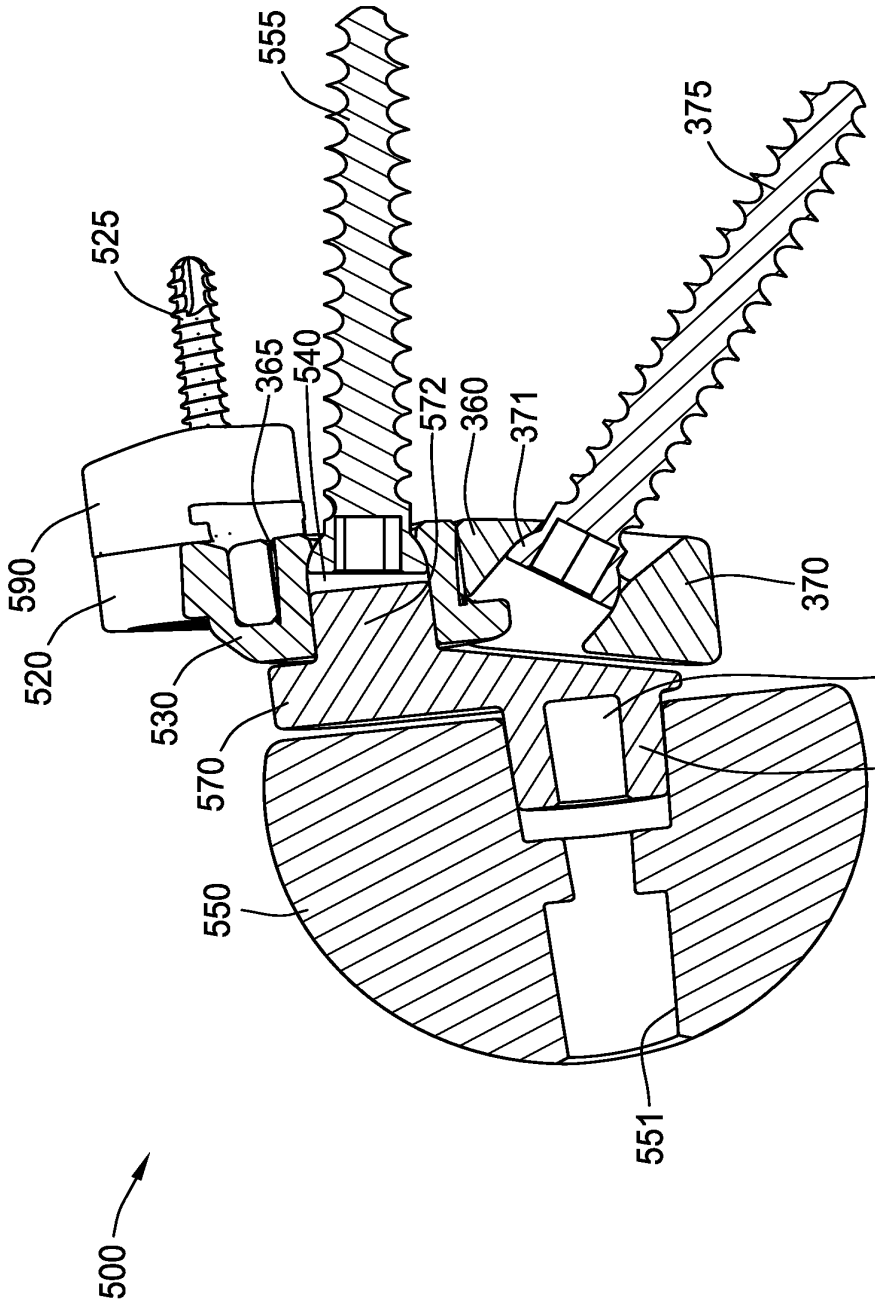

500
520
525
530
540
550
551
555
570
571
572
574
590
360
365
370
371
375

FIG. 27

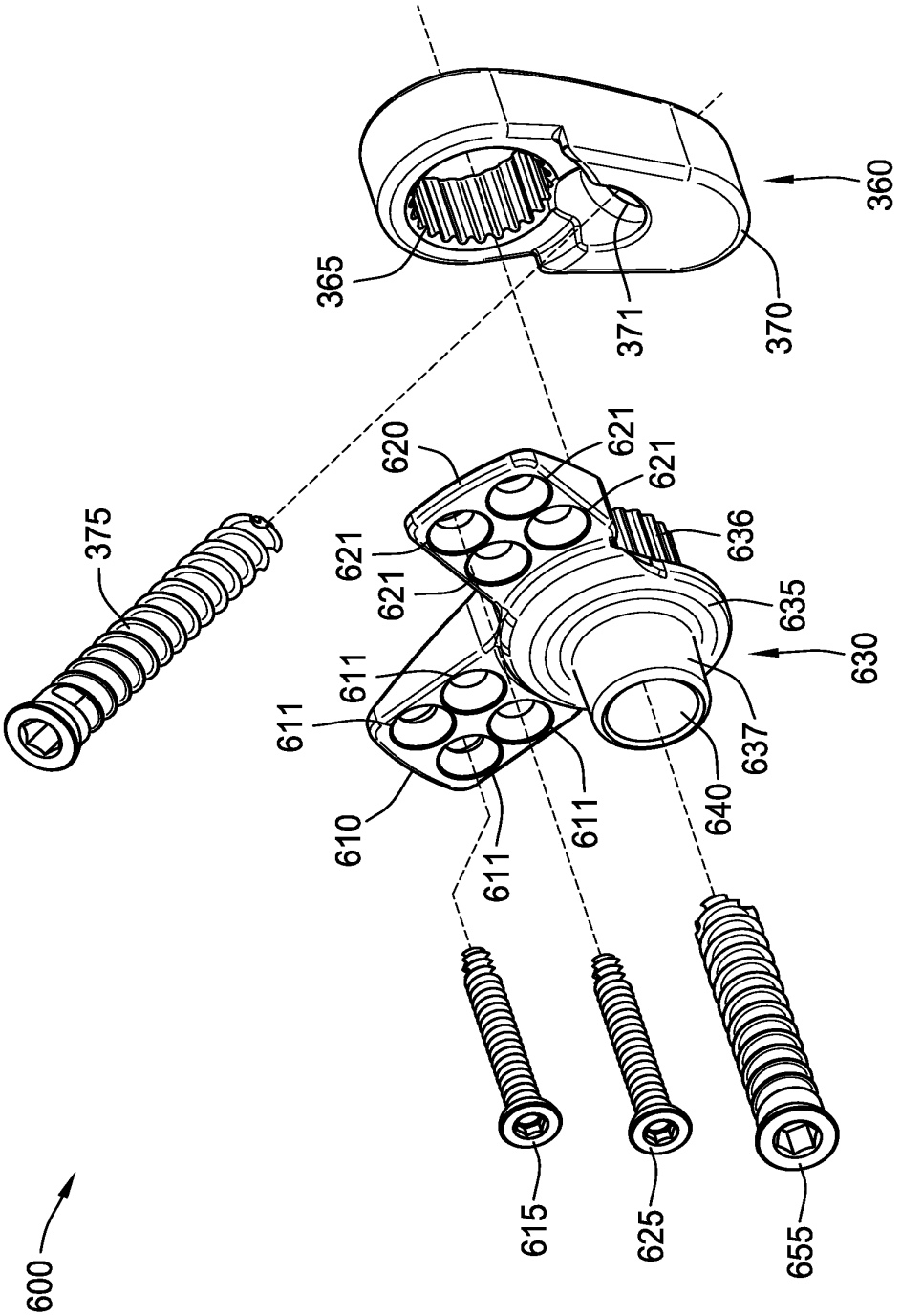

600
615
625
655
610
611
611
611
611
620
621
621
621
621
621
636
635
630
637
640
375
365
371
370
360

FIG. 28

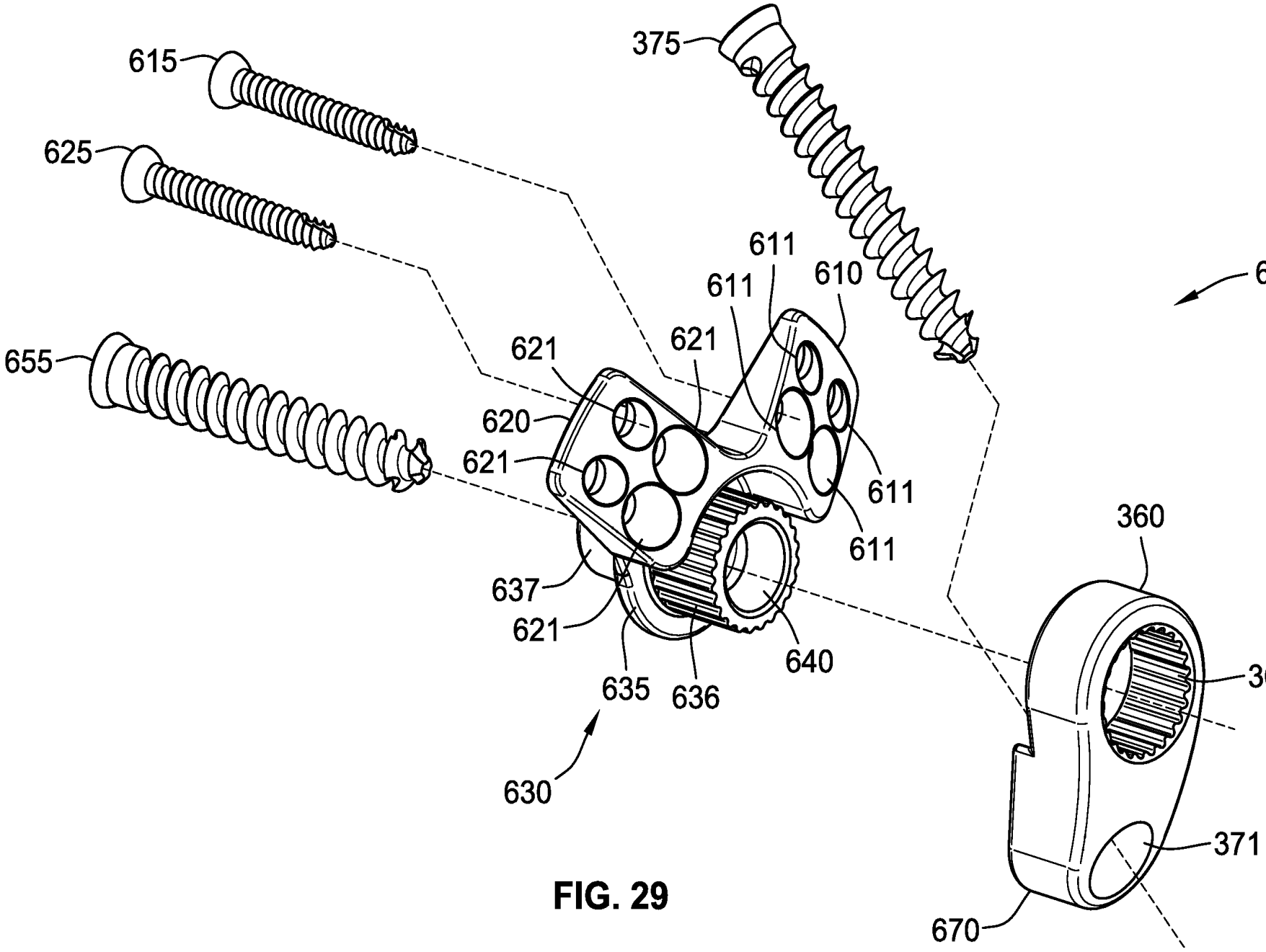

615
625
655
375
611
611
610
621
621
620
621
611
611
637
621
640
635
636
630
360
371
670

FIG. 29

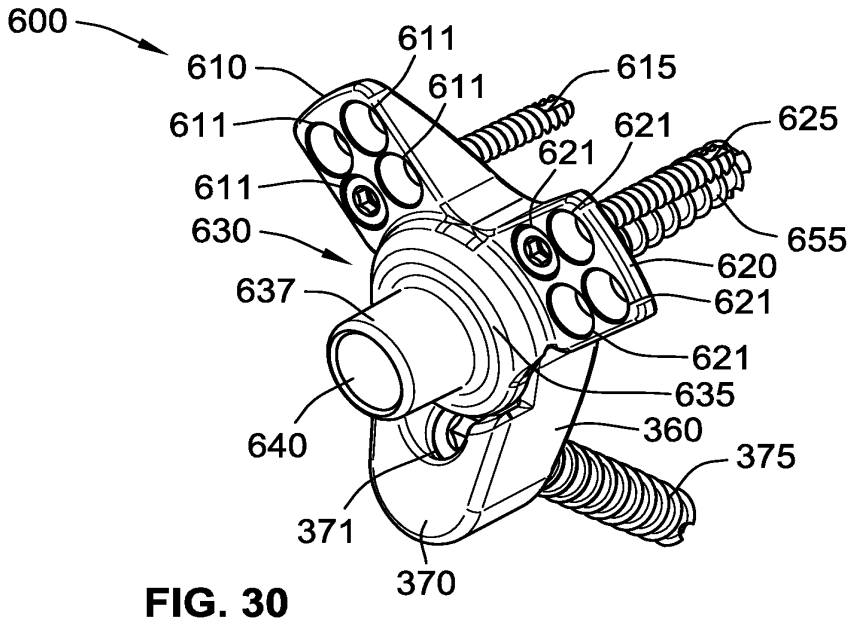

600
610
611
611
611
611
615
621
621
625
655
630
620
637
621
621
635
640
360
375
371
370

FIG. 30

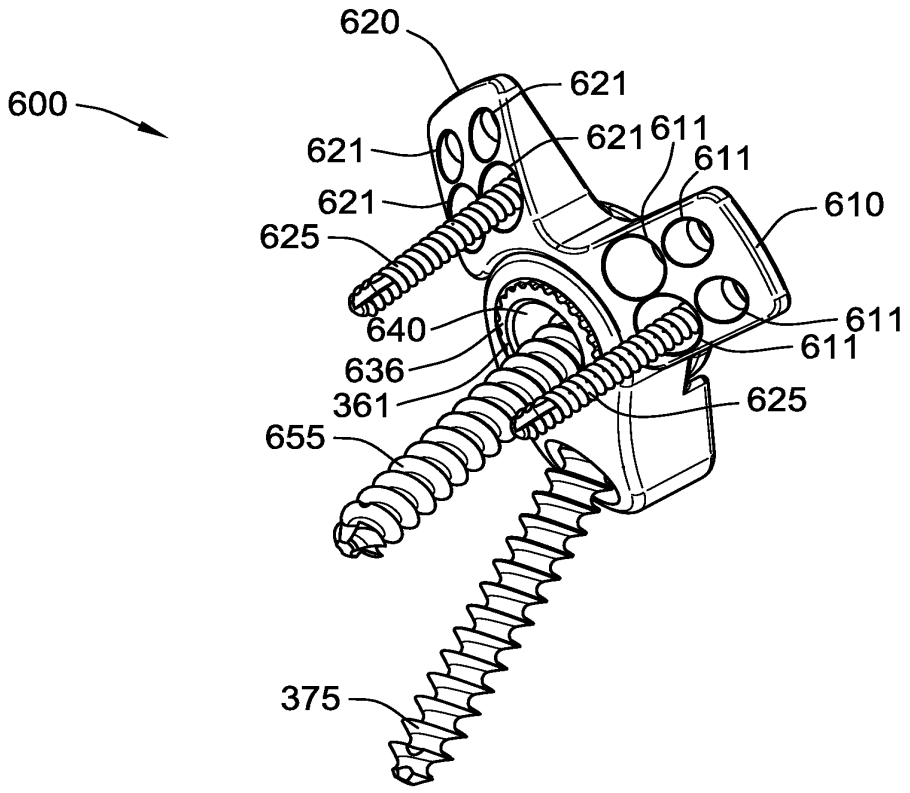

620
600
621
621
621
621
611
611
610
621
625
640
611
611
636
361
625
655
375

FIG. 31

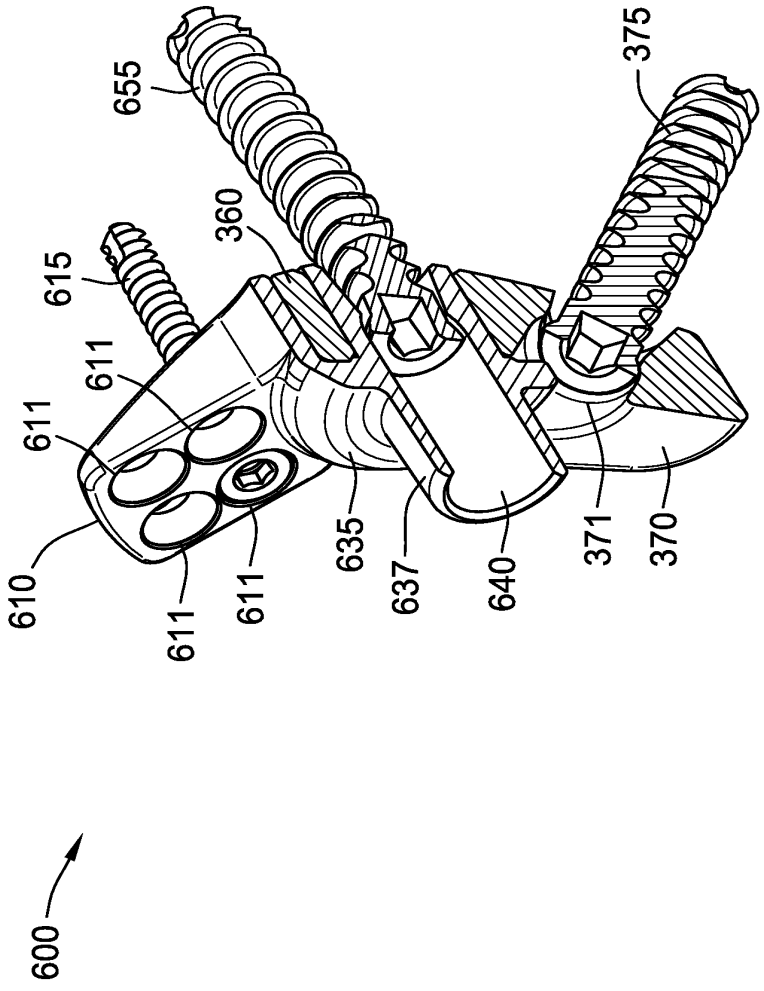


FIG. 32

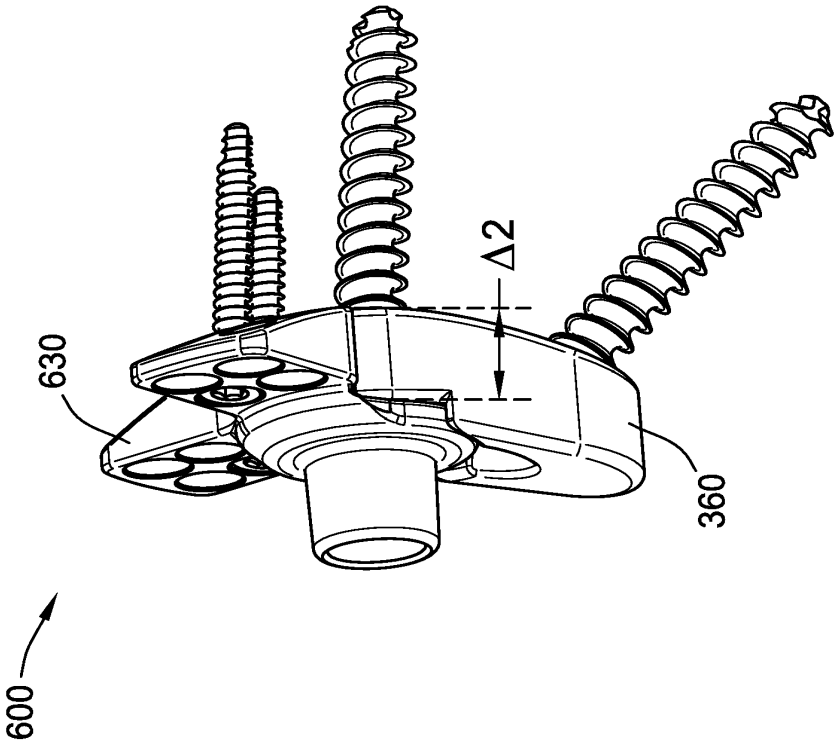


FIG. 34

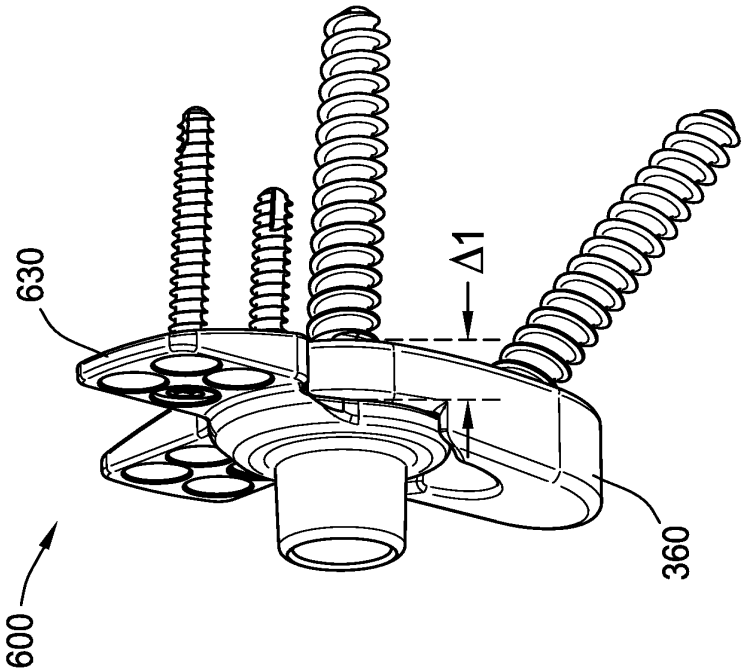


FIG. 33

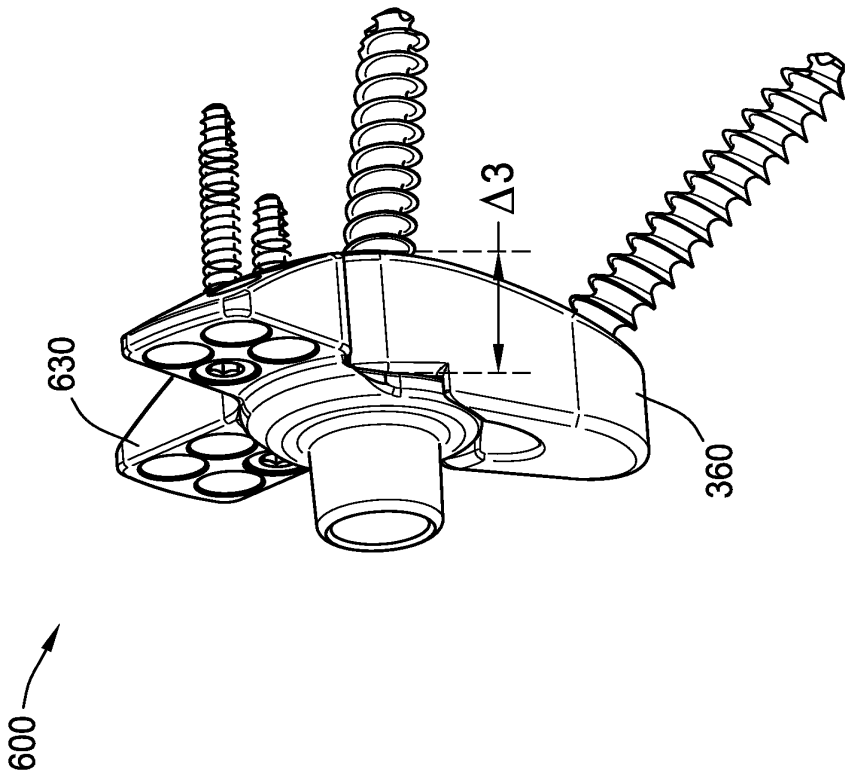


FIG. 35

370
371
365
750
360
730
735
736
740
711
711
711
711
721
721
712
710
722
721
720
725
715
375

FIG. 36

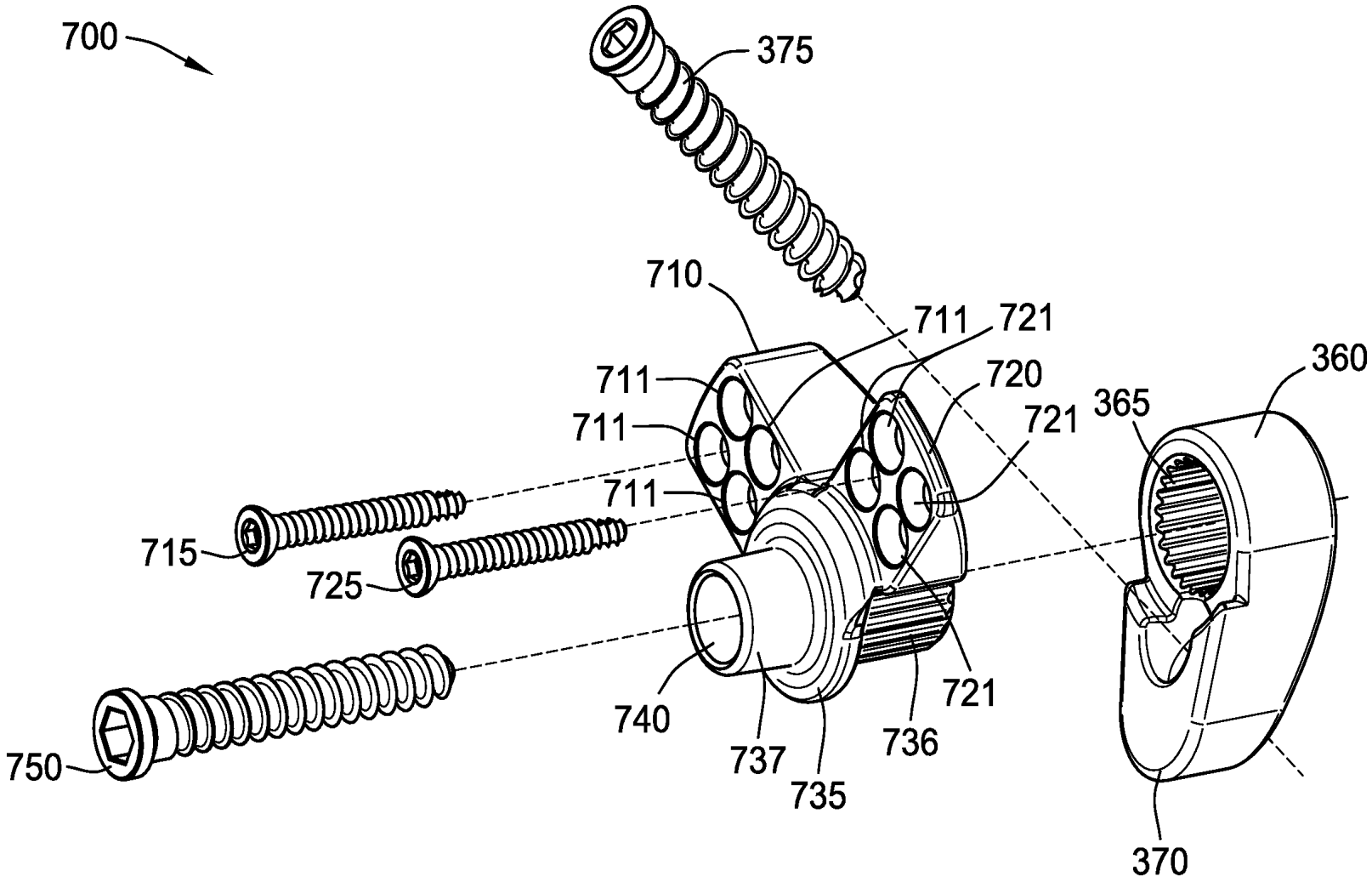

700
375
710
711
721
711
720
360
365
711
721
711
715
725
740
737
735
736
721
750
370

FIG. 37

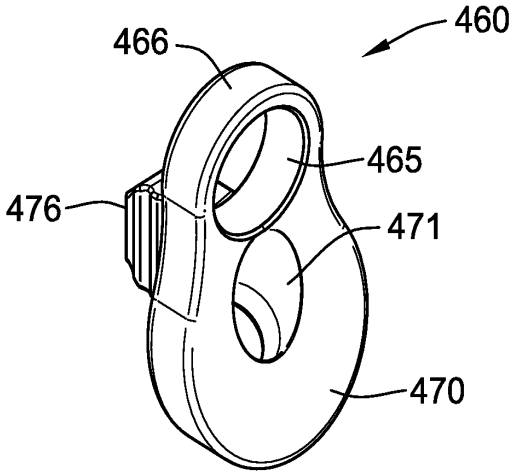


FIG. 38

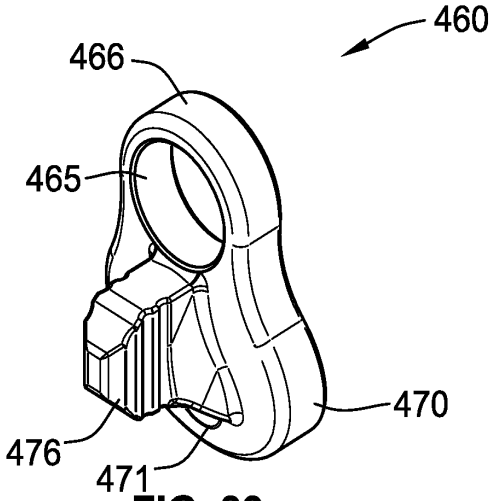


FIG. 39

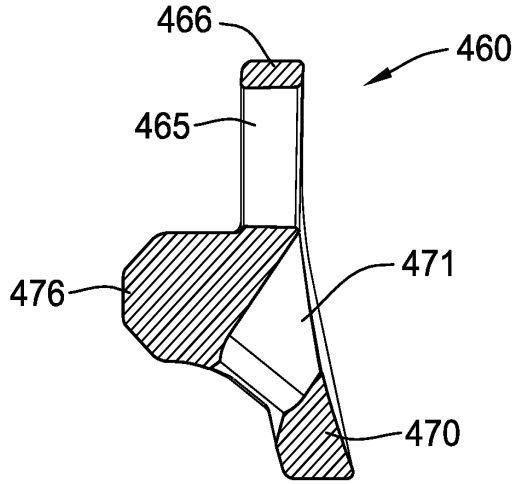


FIG. 40

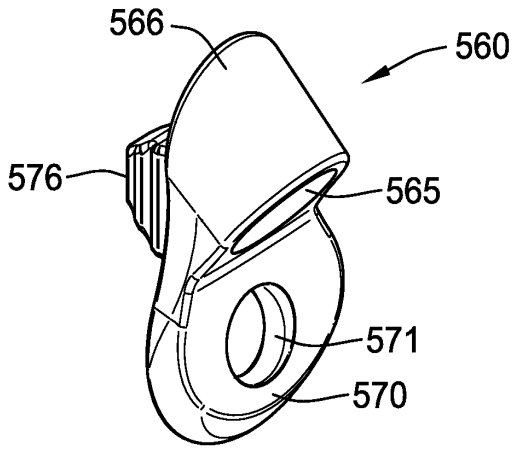


FIG. 41

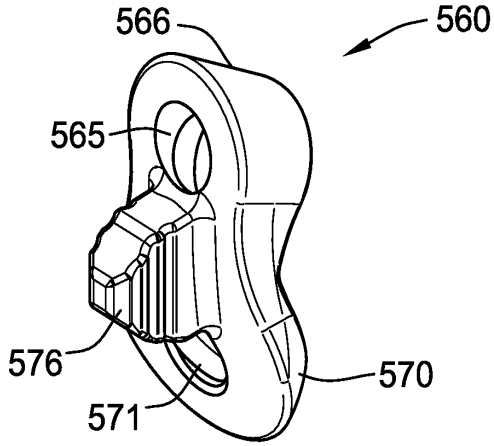


FIG. 42

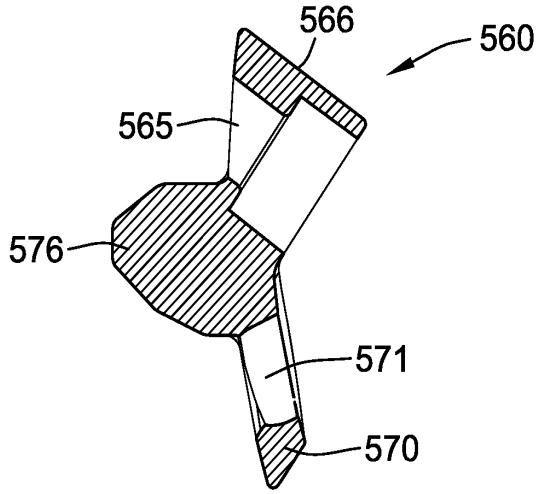


FIG. 43

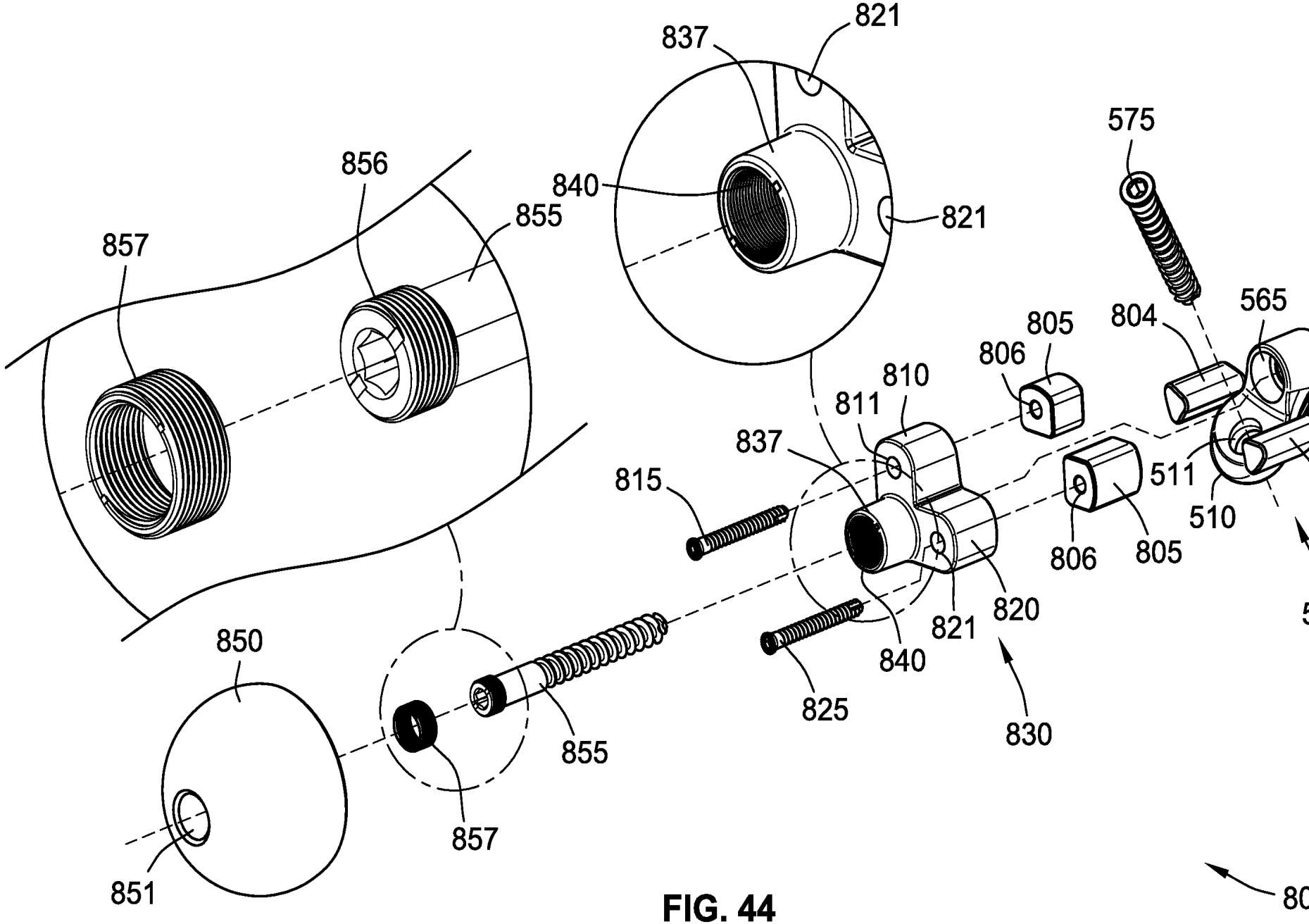

821
837
575
856
840
821
855
857
805
804
565
806
810
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837
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511
510
806
805
820
821
840
825
830
850
855
857
851
80

FIG. 44

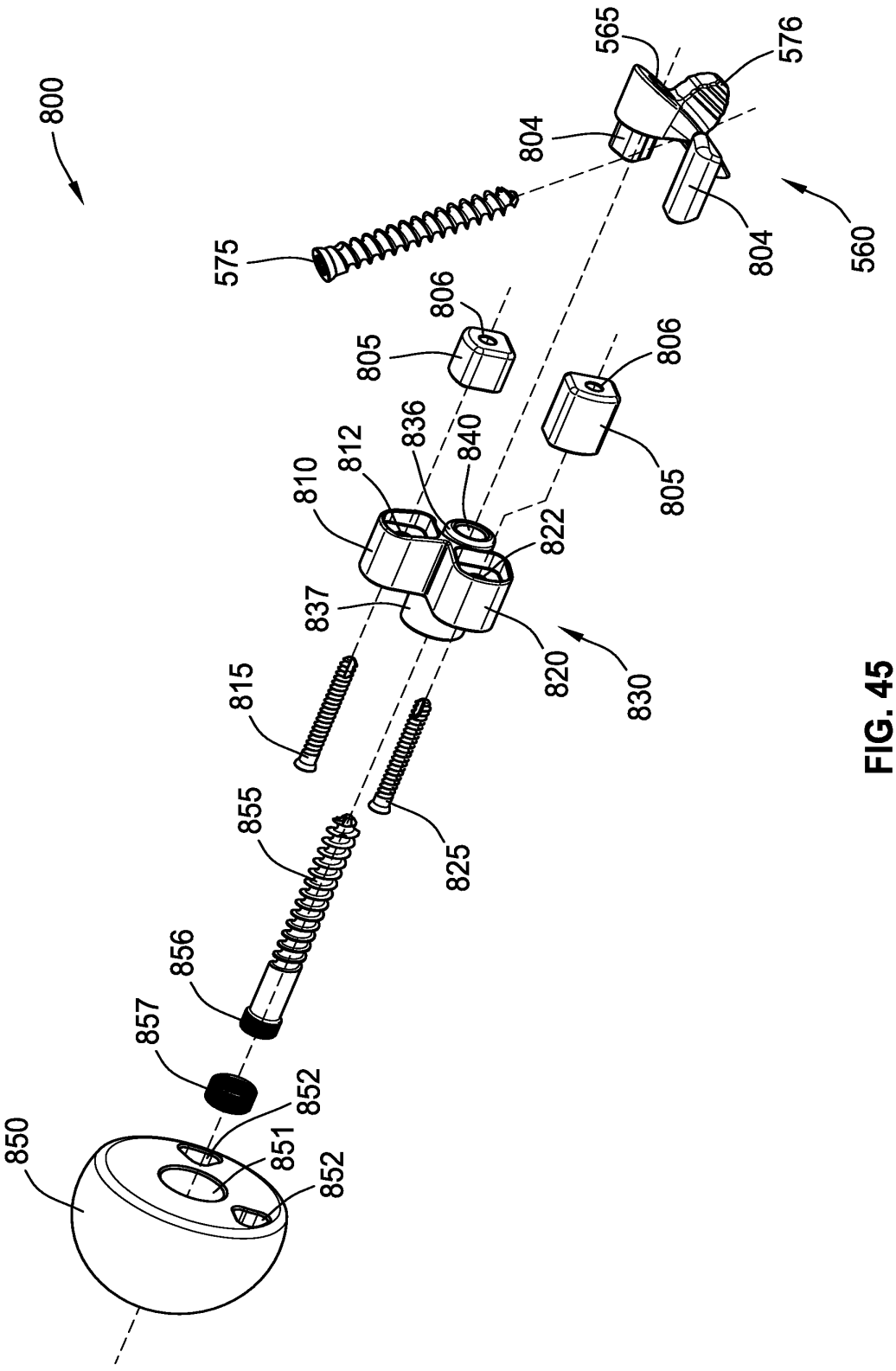

800
565
576
804
575
804
560
806
805
806
805
836
840
812
810
822
837
820
830
815
855
825
856
857
852
850
851
852

FIG. 45

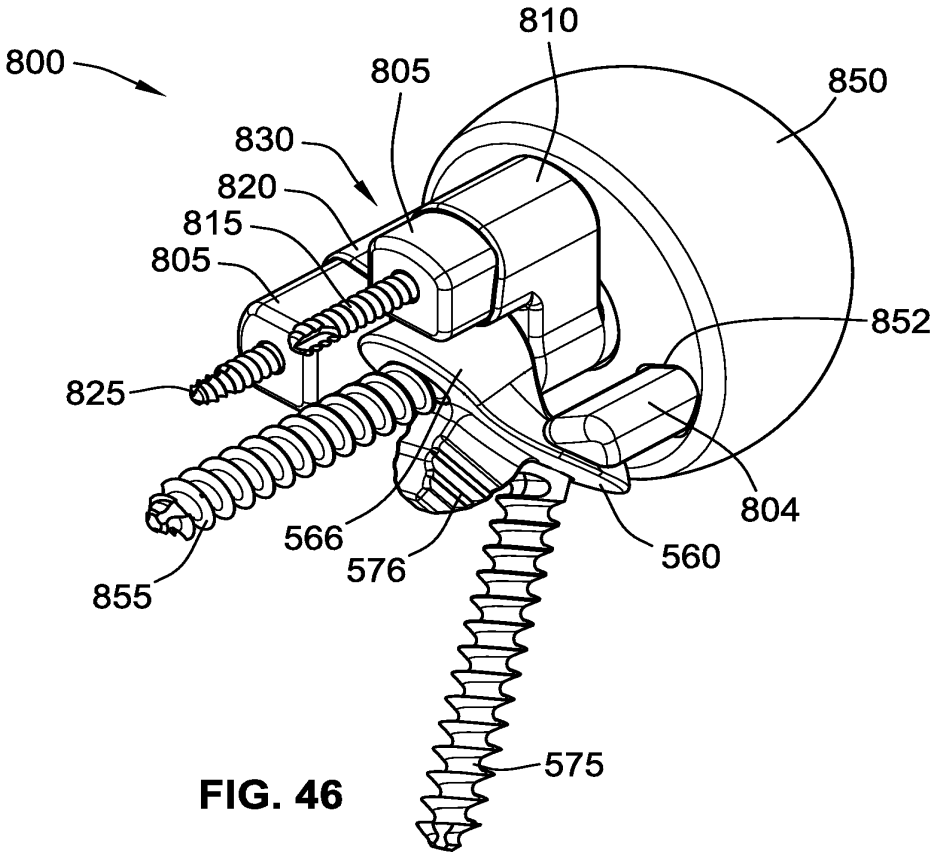

800
810
805
850
830
820
815
805
852
825
804
566
576
560
855
575

FIG. 46

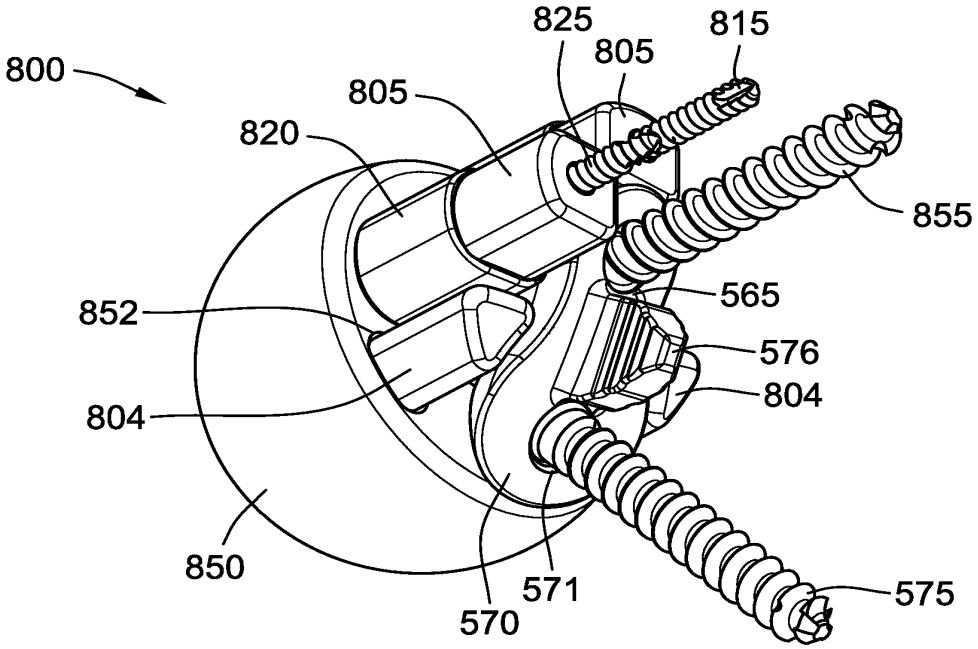

825
815
805
800
805
820
855
565
852
576
804
804
850
571
575
570

FIG. 47

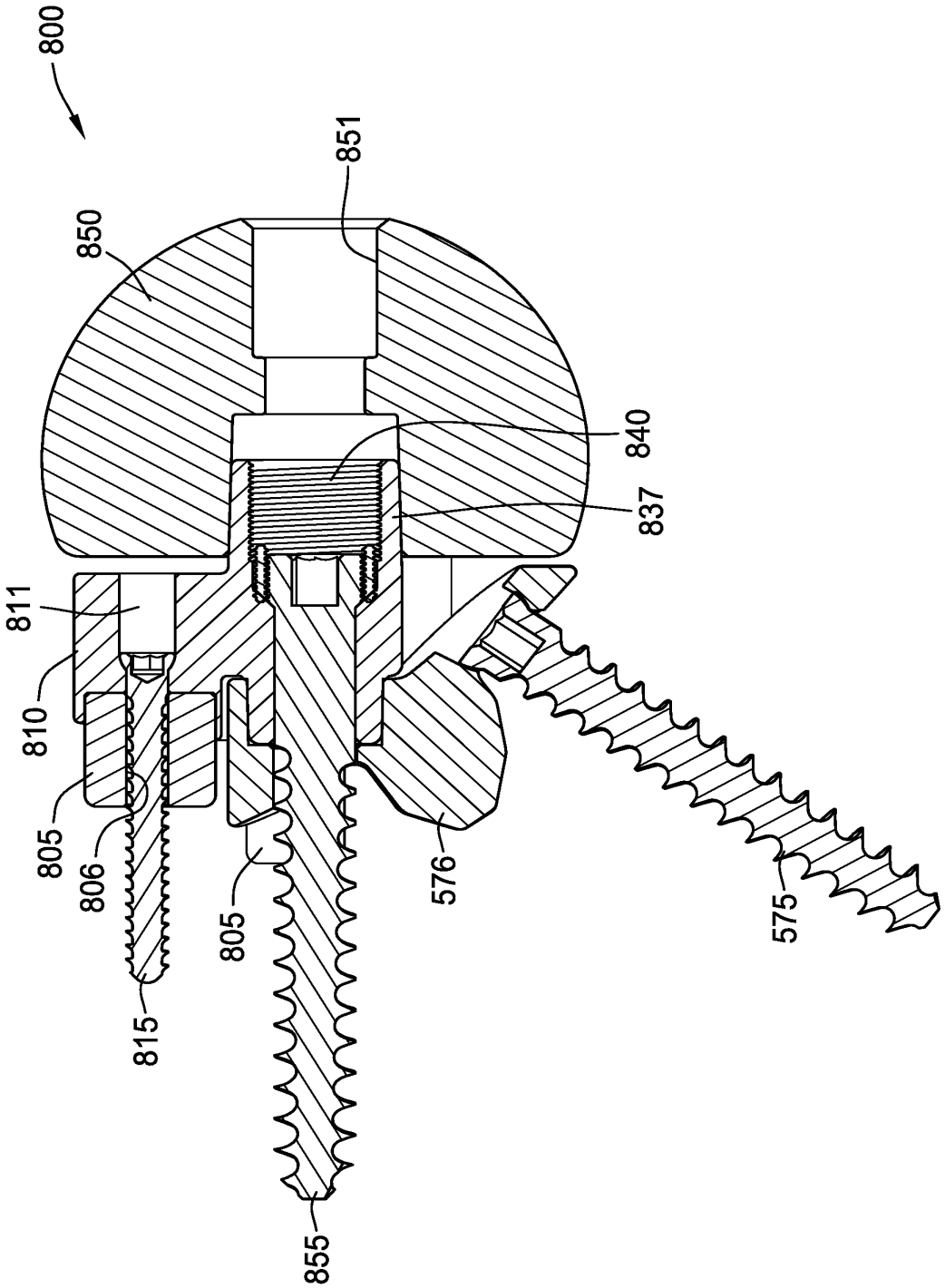


FIG. 48

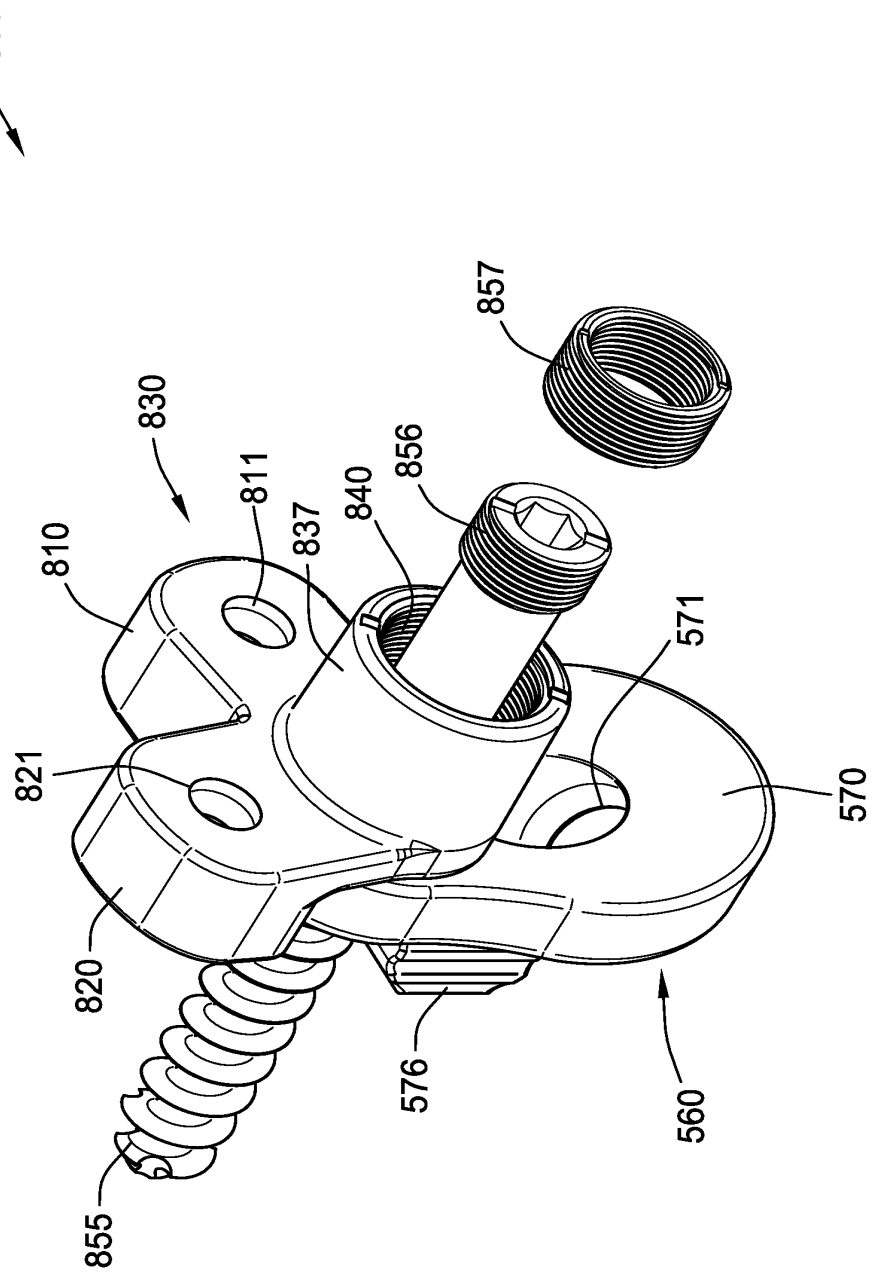


FIG. 49

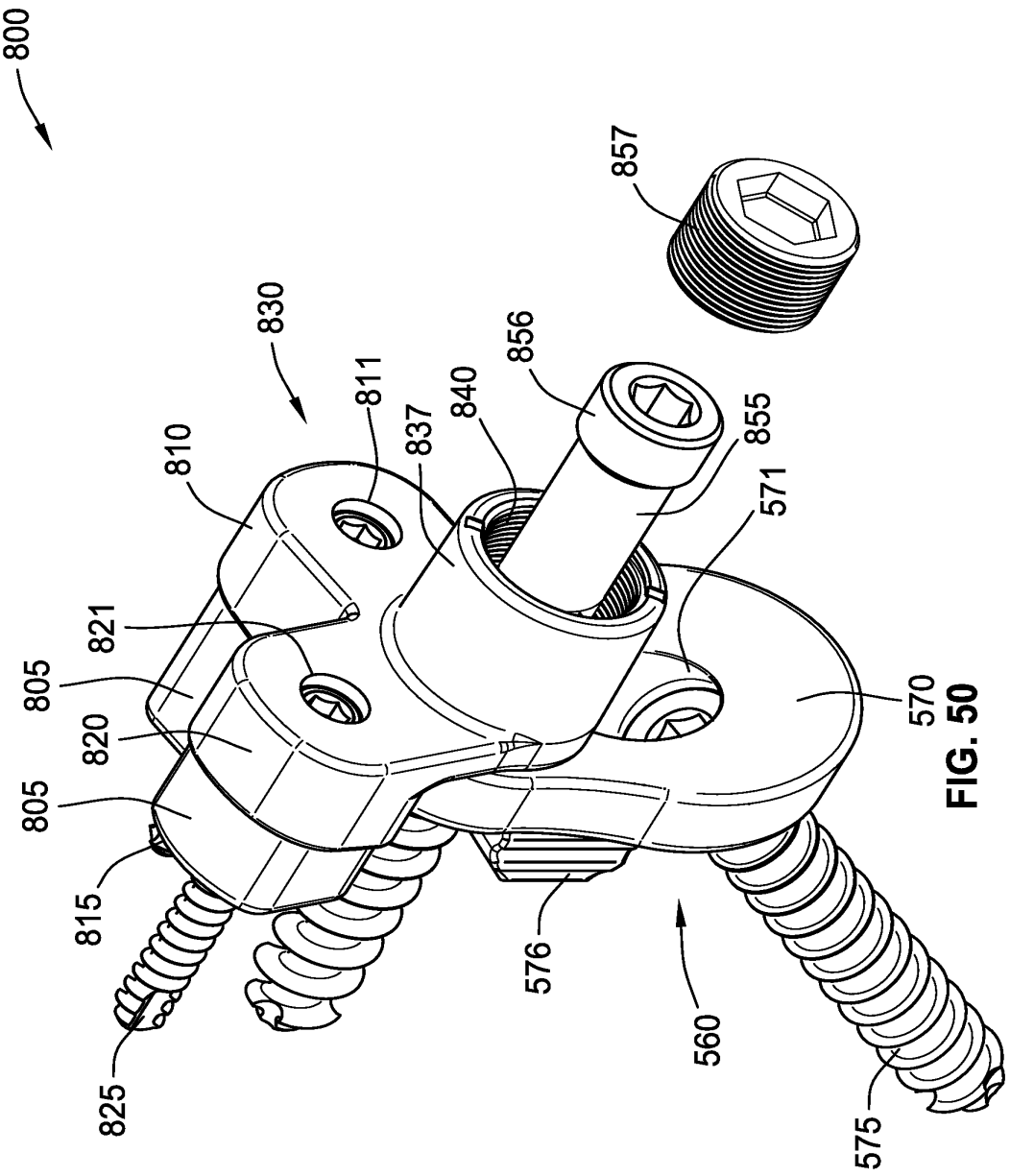

800
857
830
856
811
840
855
837
810
571
821
805
570
820
805
815
576
560
825
575

FIG. 50

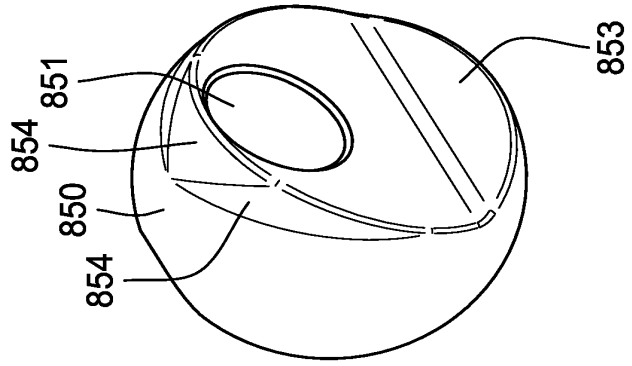


FIG. 53

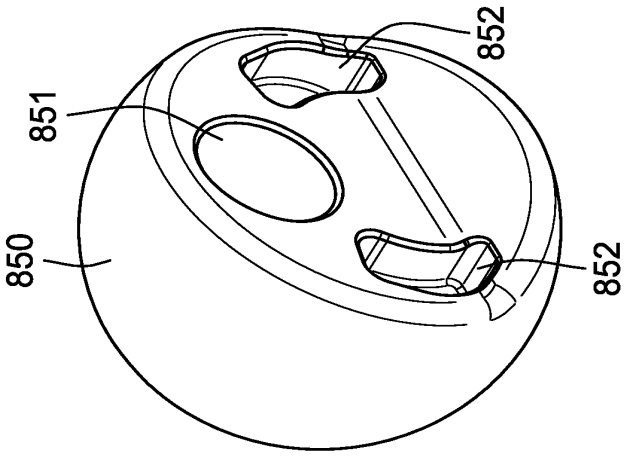


FIG. 52

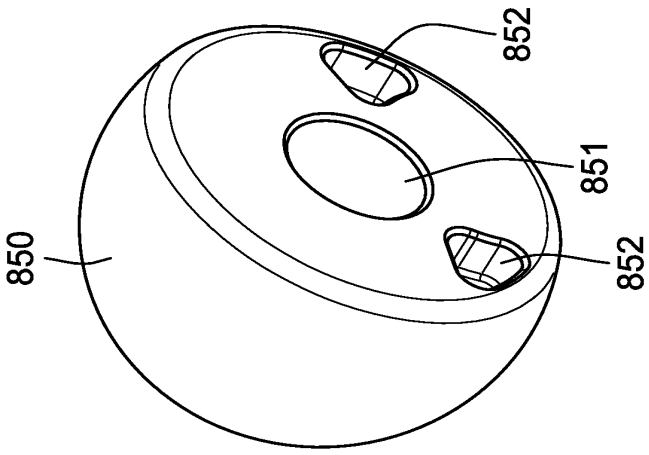


FIG. 51

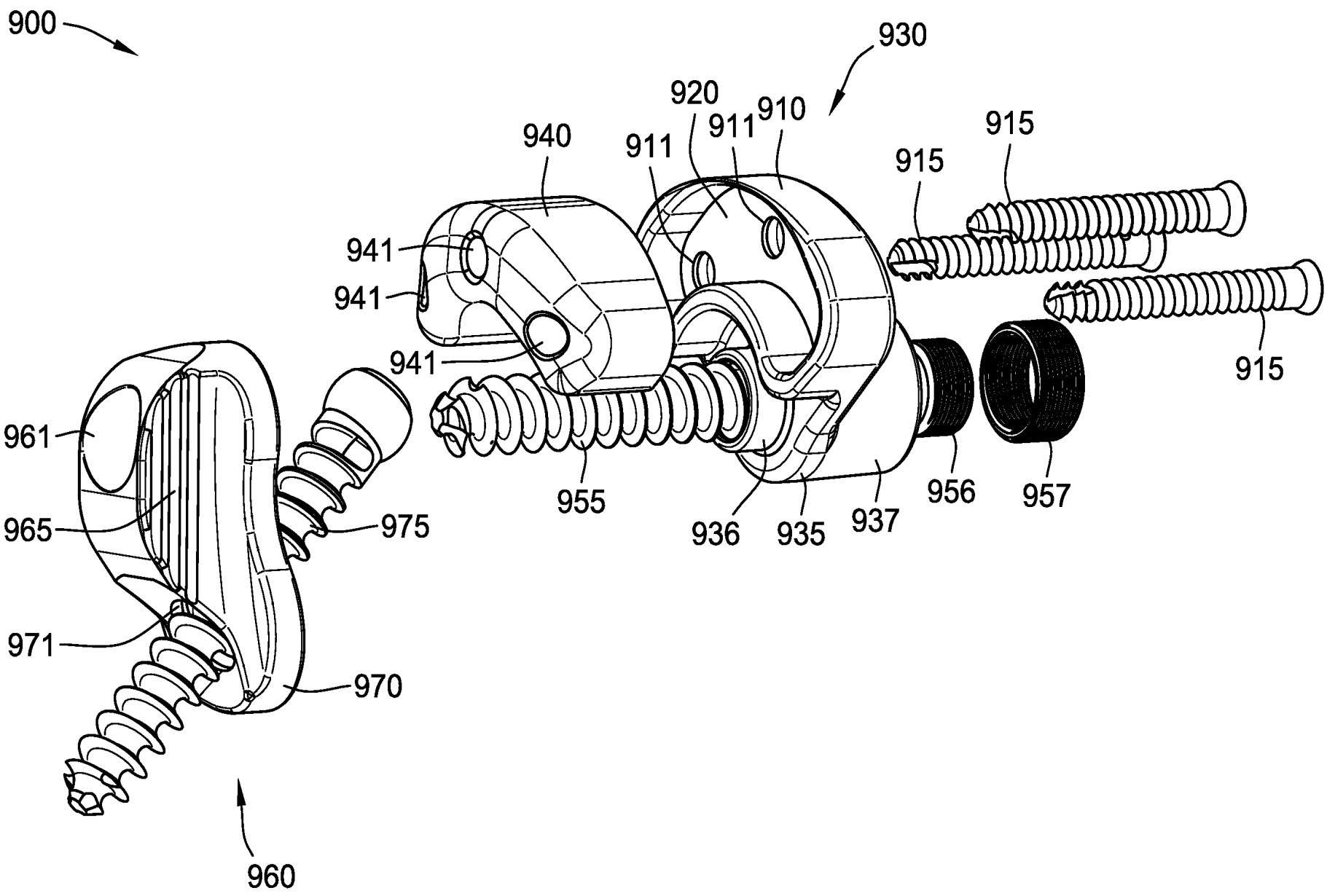

900
930
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937
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957

FIG. 54

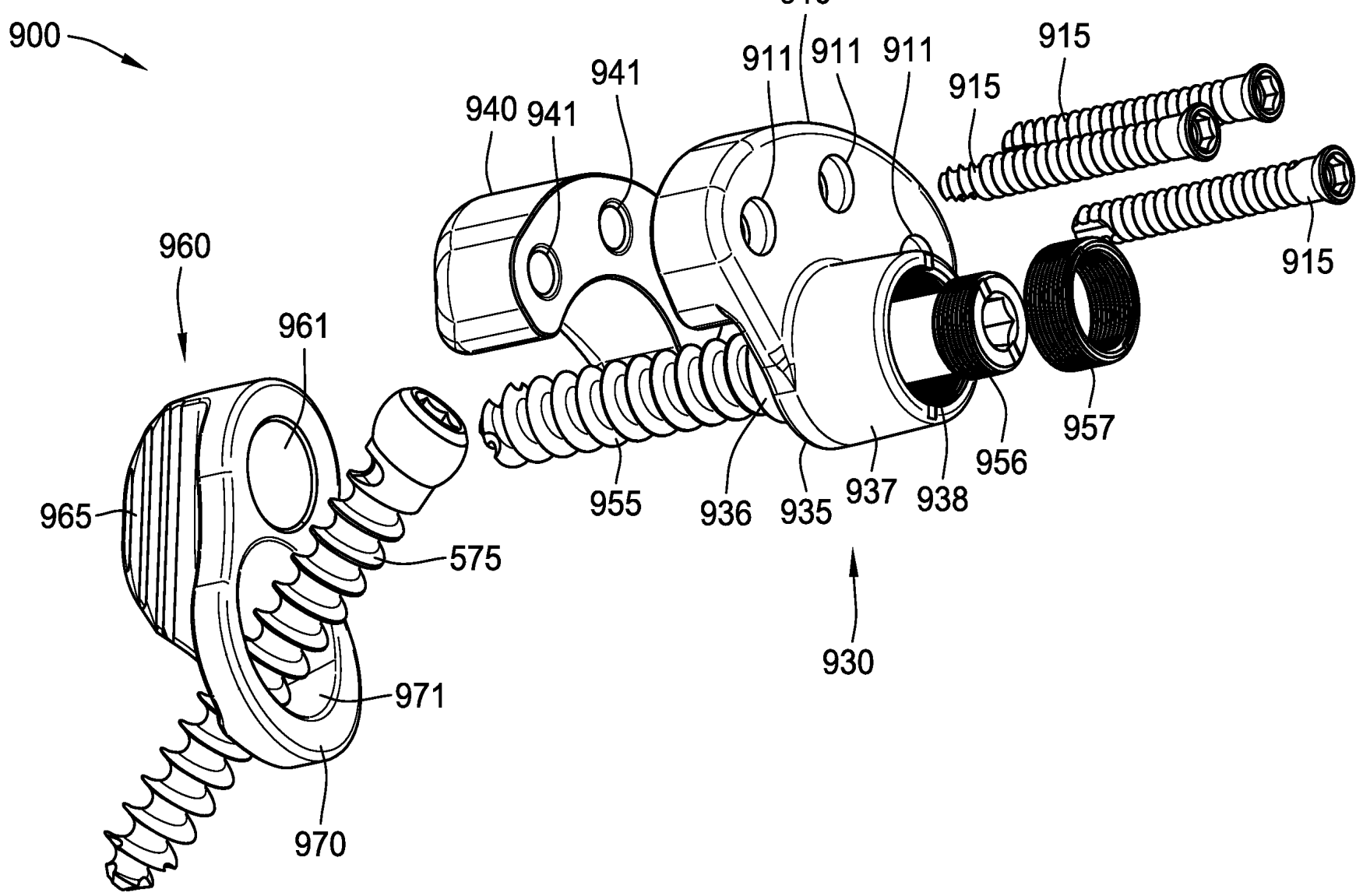

900
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FIG. 55

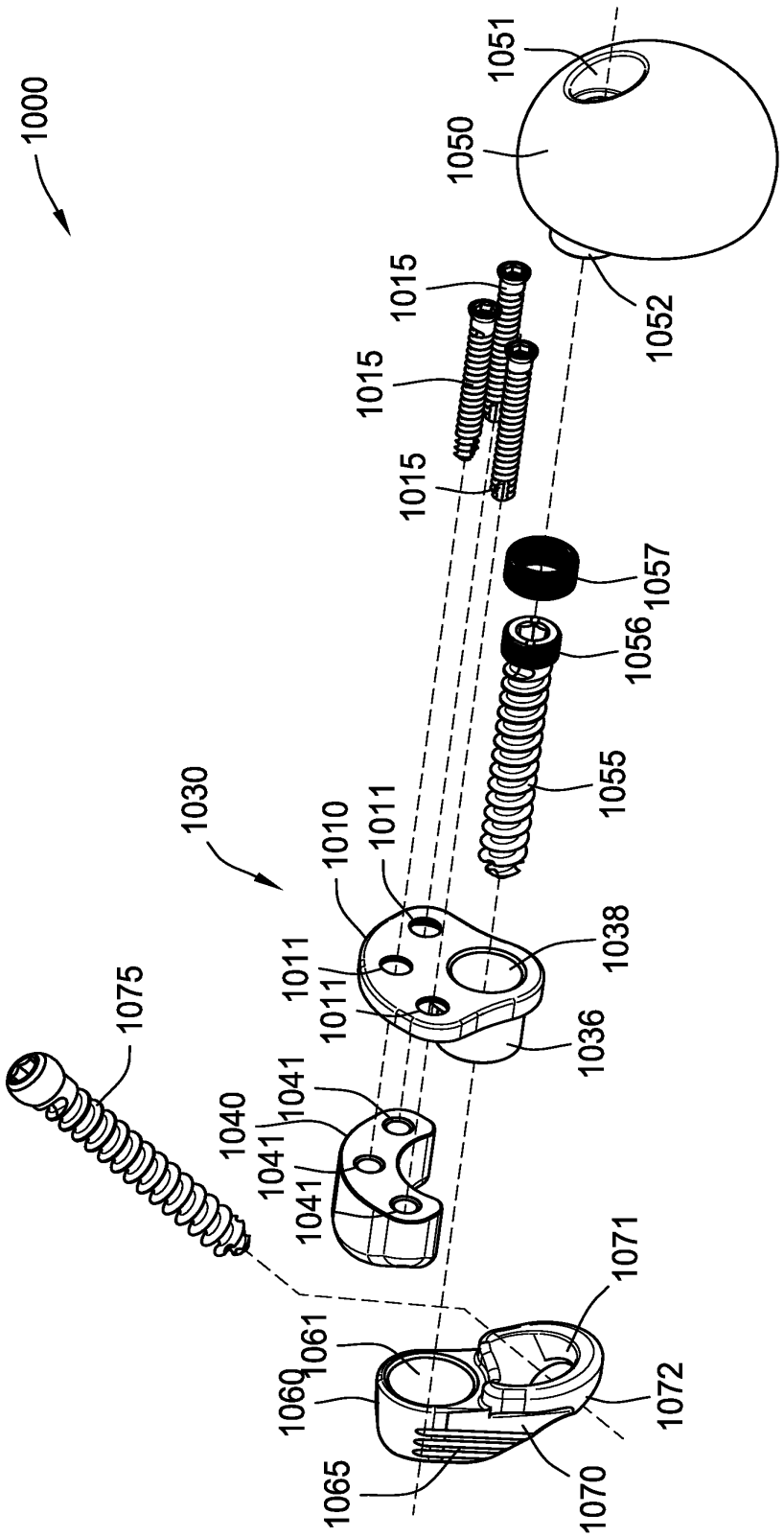

1000
1051
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1052
1015
1015
1015
1057
1056
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1010
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1011
1011
1038
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FIG. 56

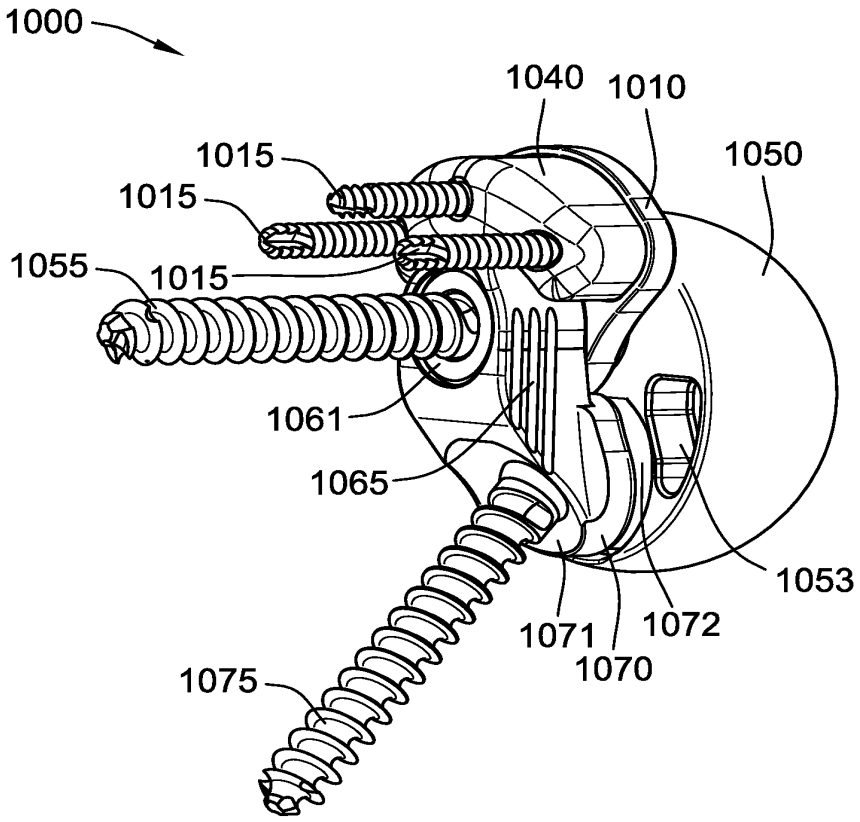

1000
1040
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1015
1061
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1053
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FIG. 57

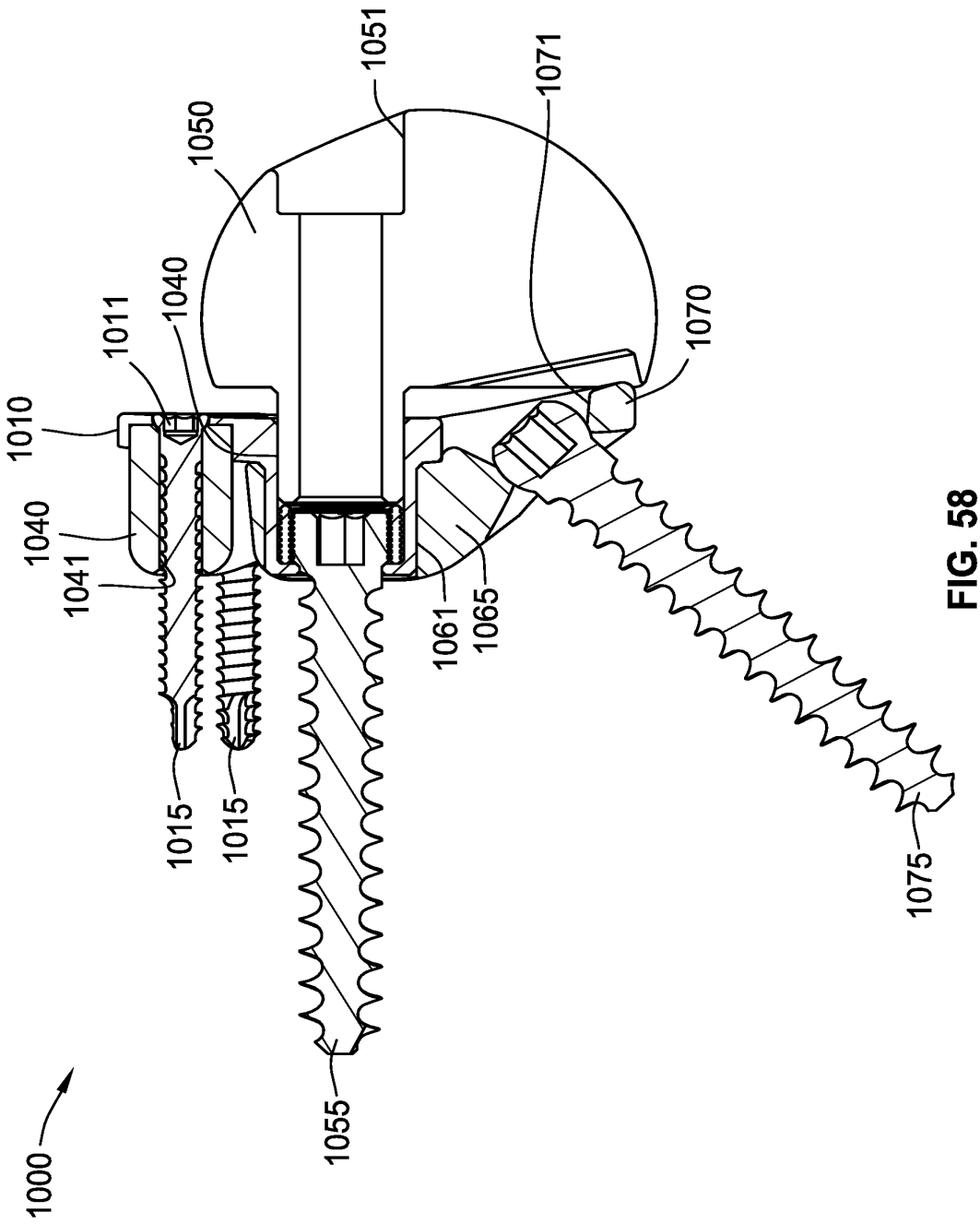

1000
1010
1011
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1061
1065
1070
1071
1075
1015
1015

FIG. 58

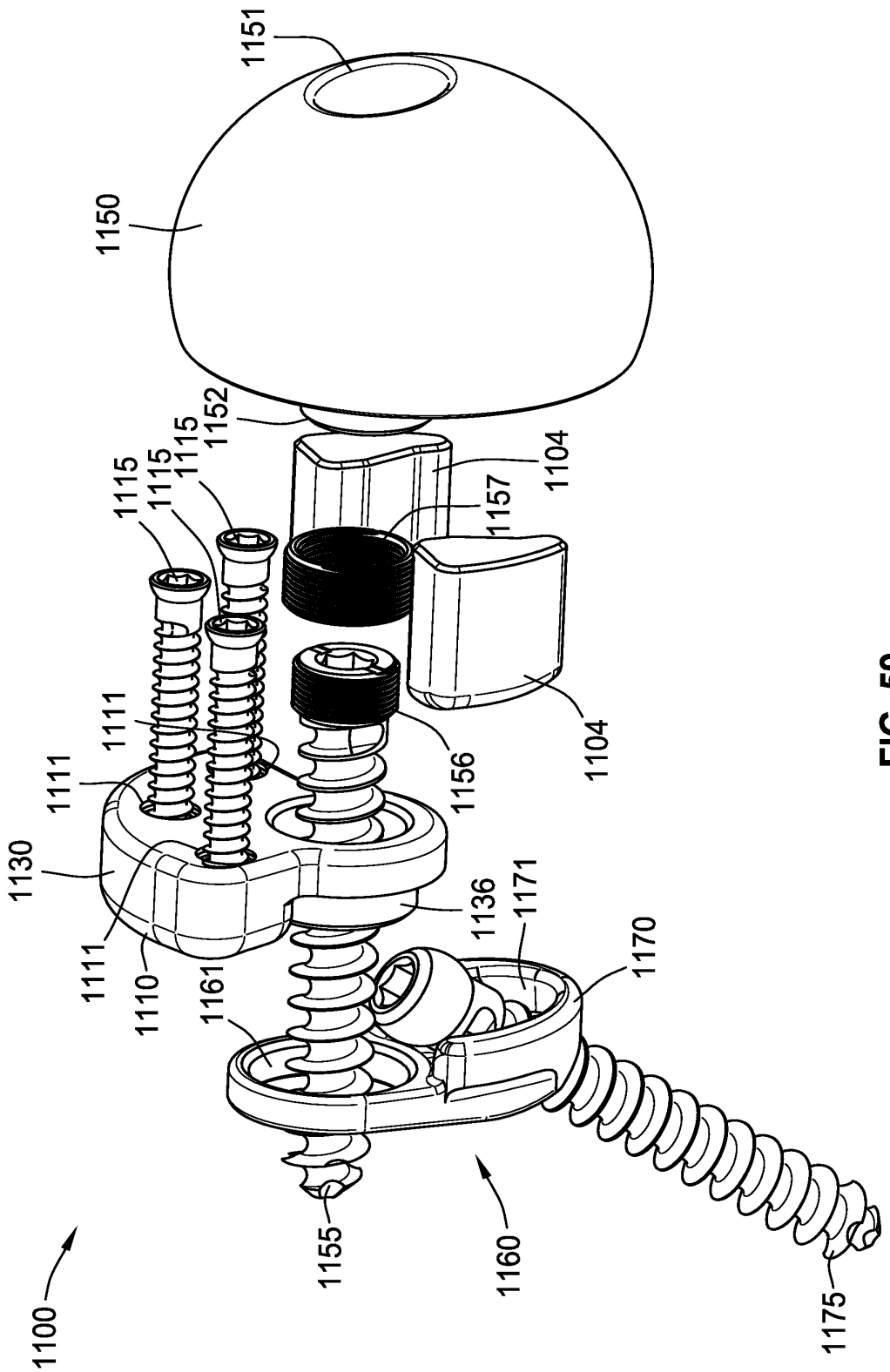

1151
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1104
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1111
1111
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1175
1100

FIG. 59

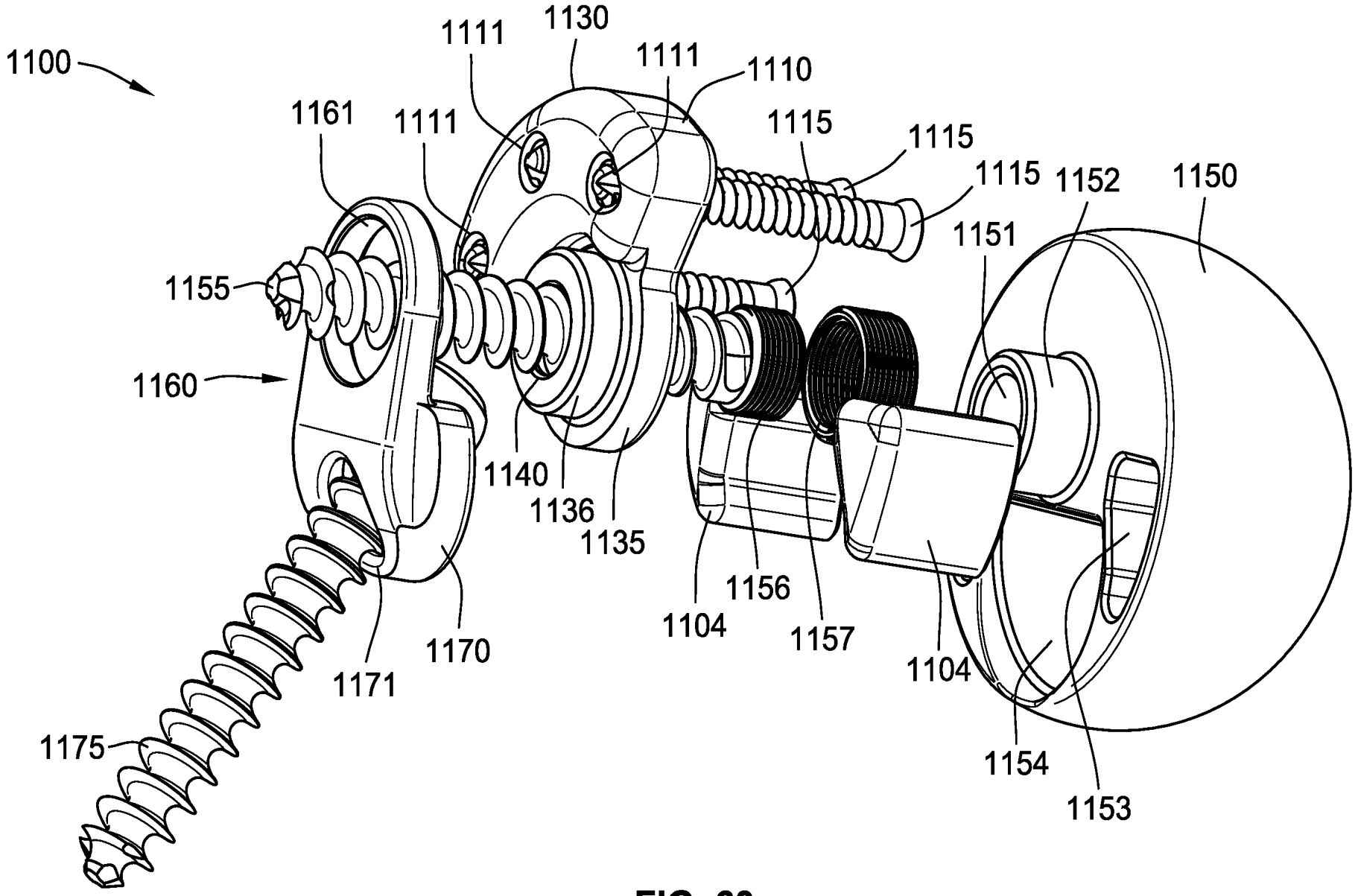

1100
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FIG. 60

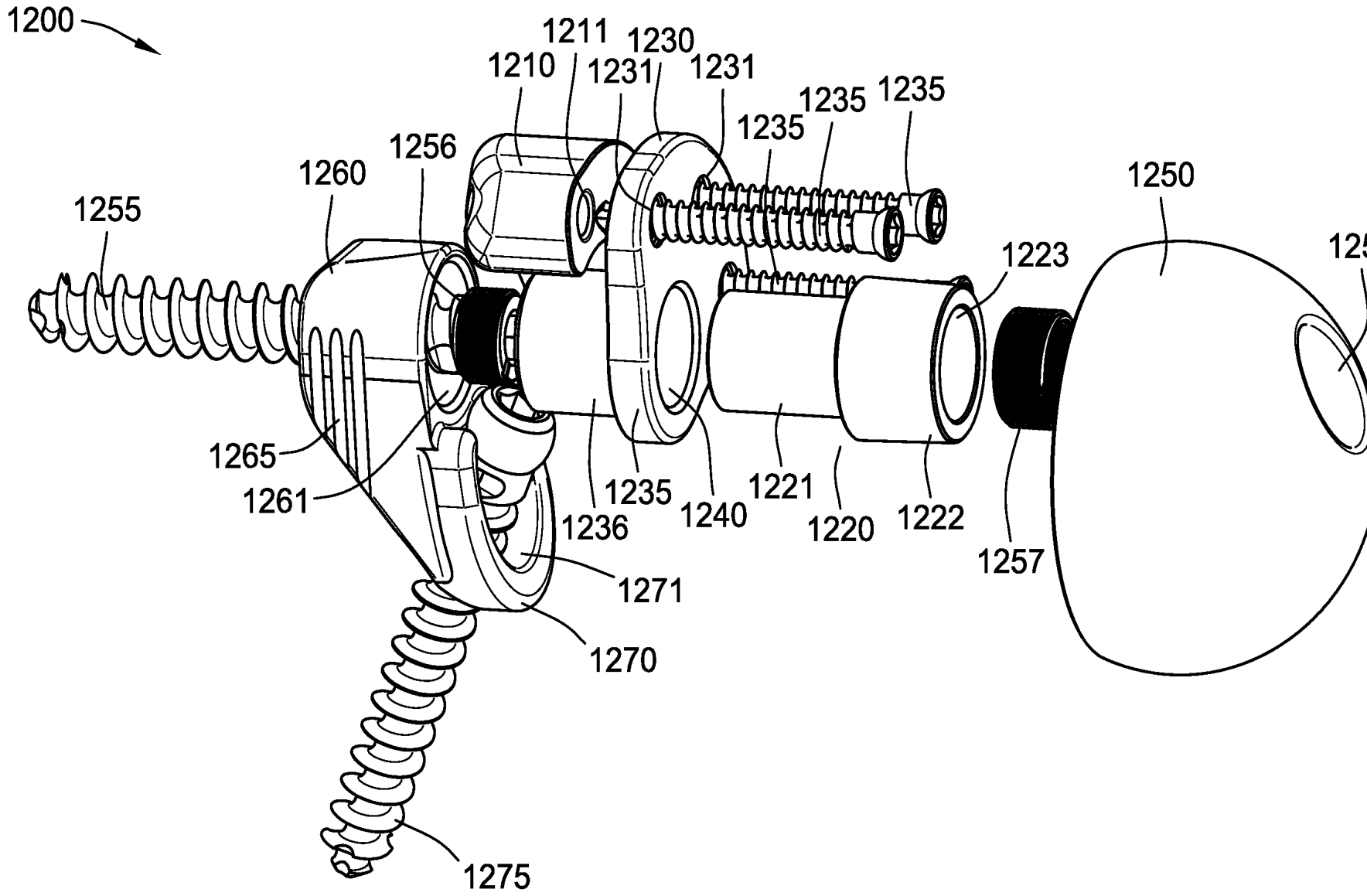

1200
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1222
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FIG. 61

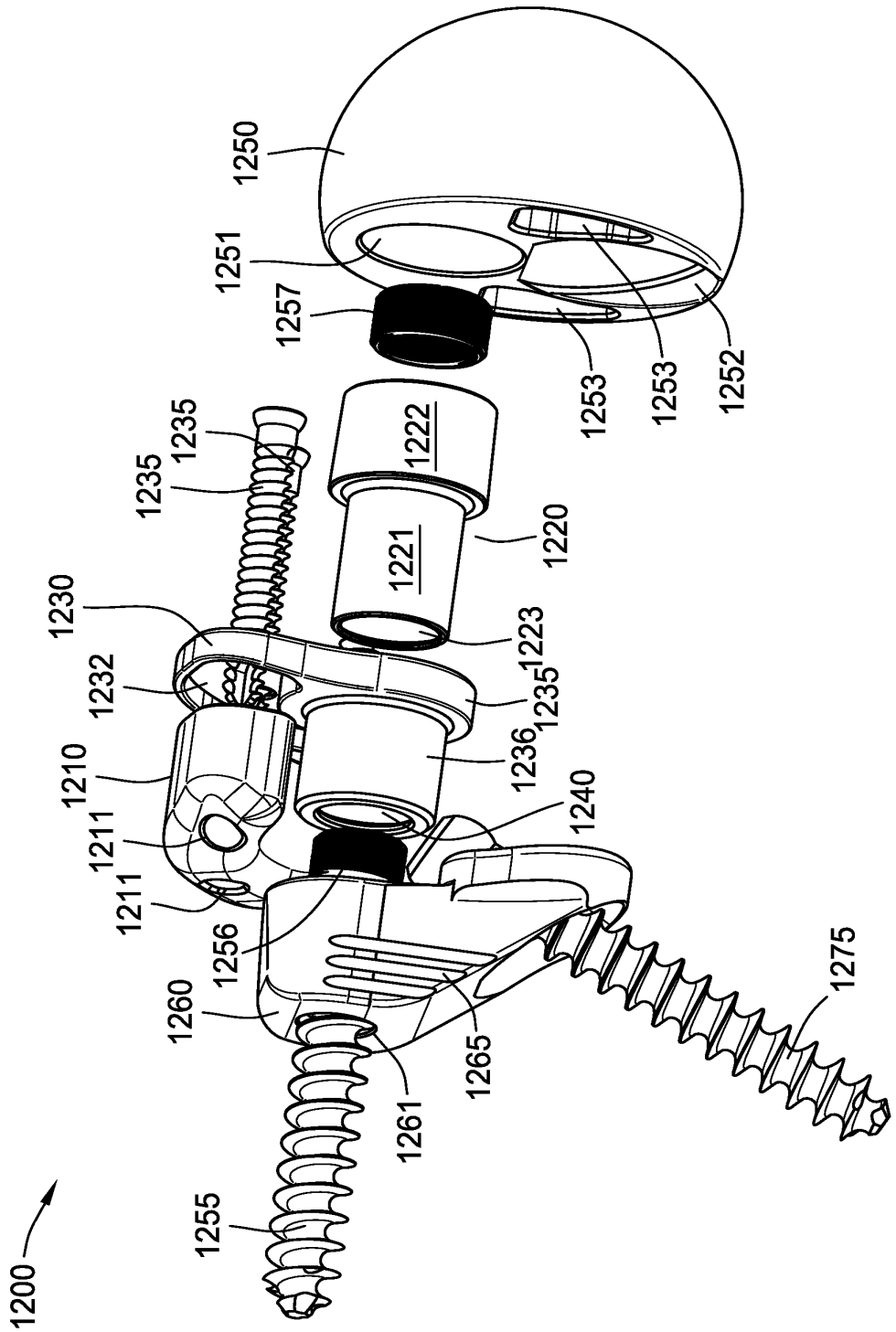

1200
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FIG. 62

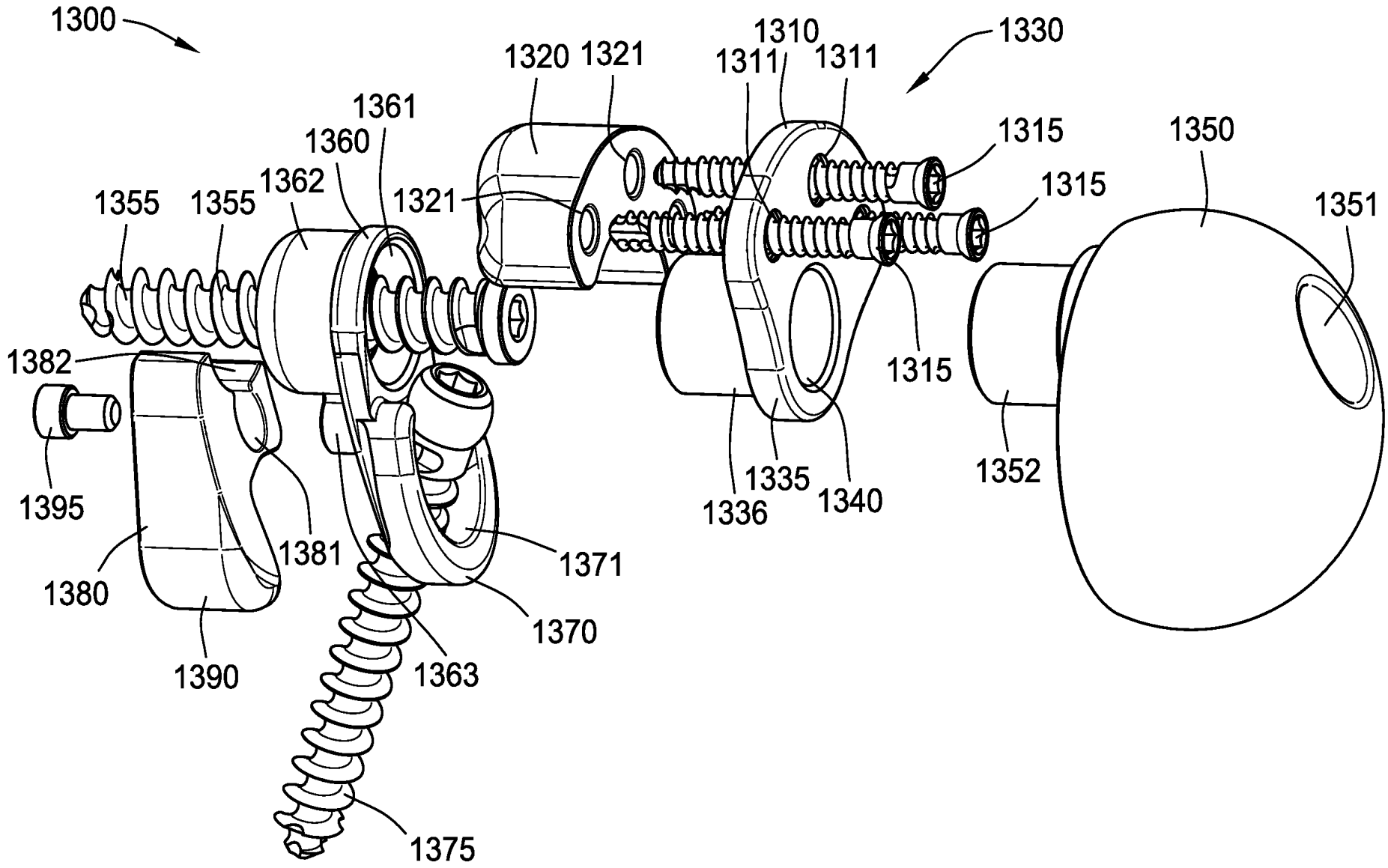

1300
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1371
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FIG. 63

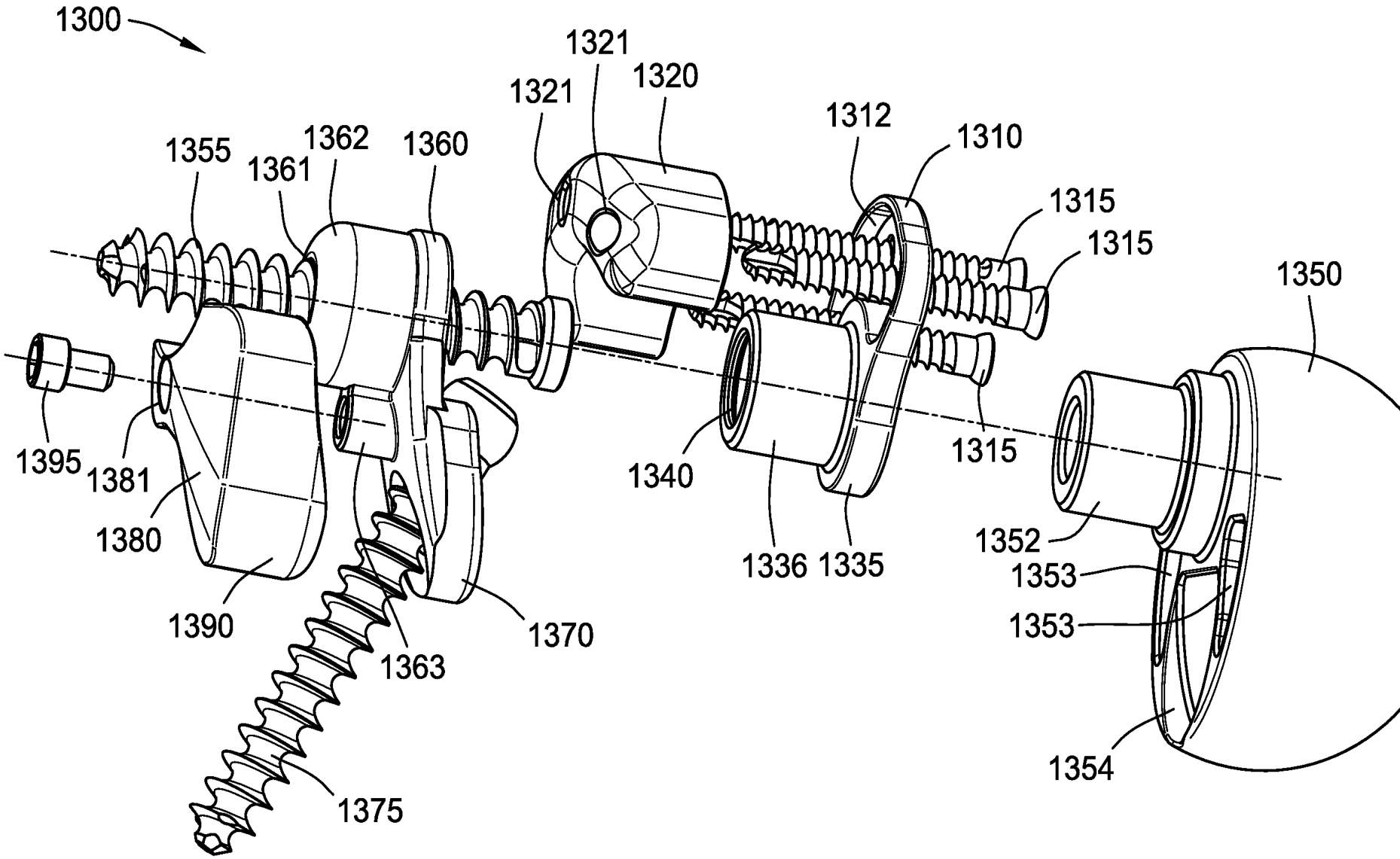

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FIG. 64

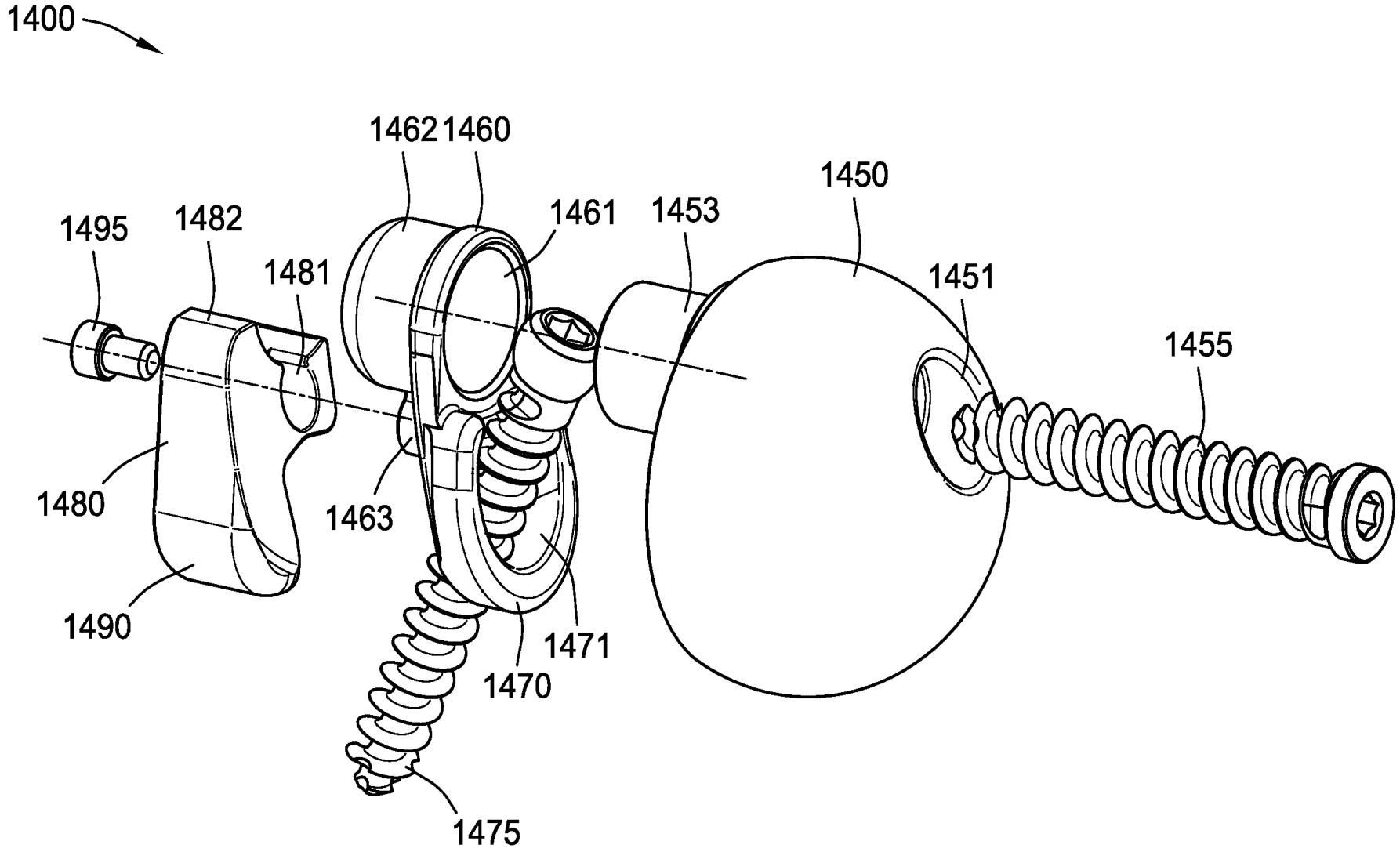

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FIG. 65

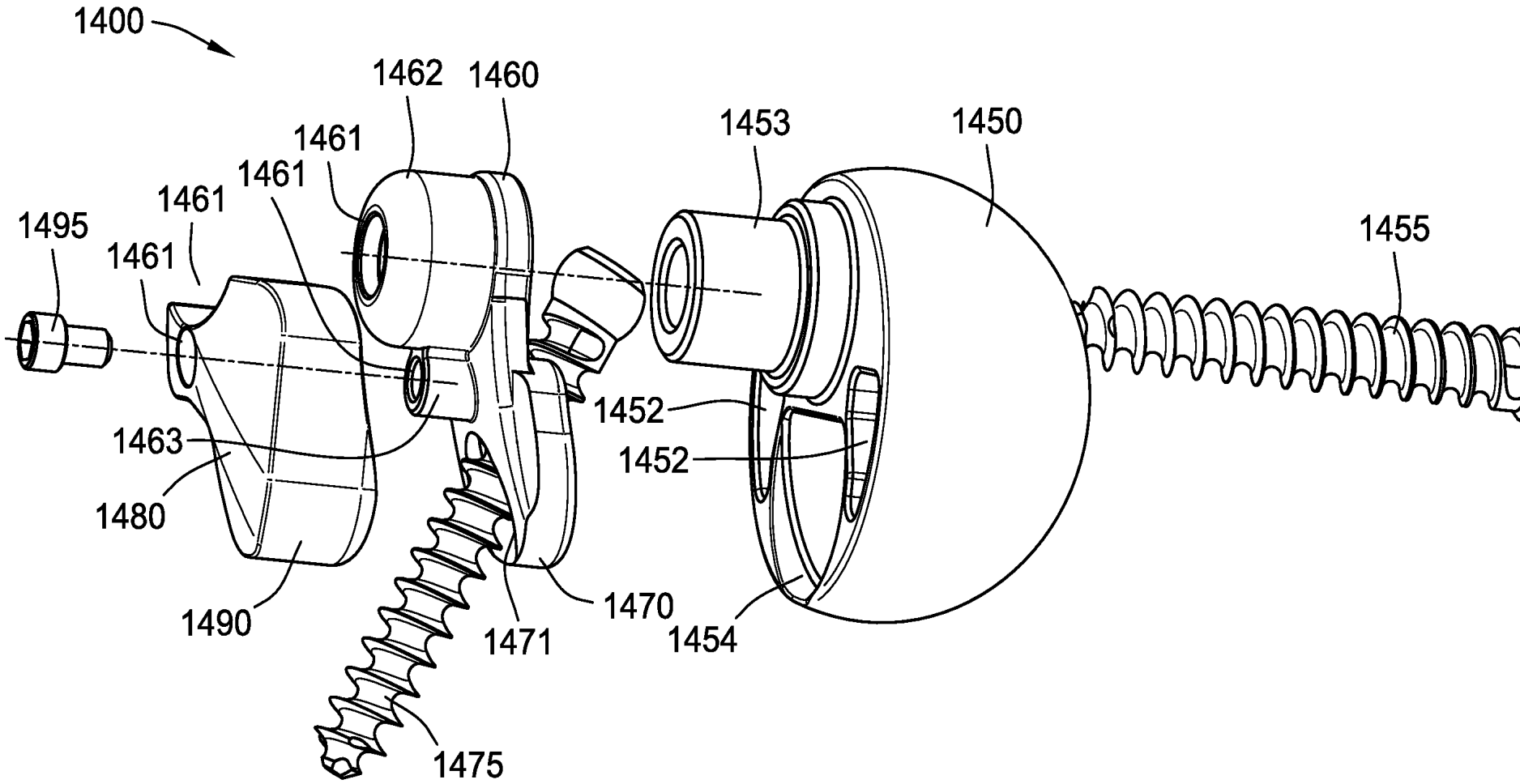

1400
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FIG. 66

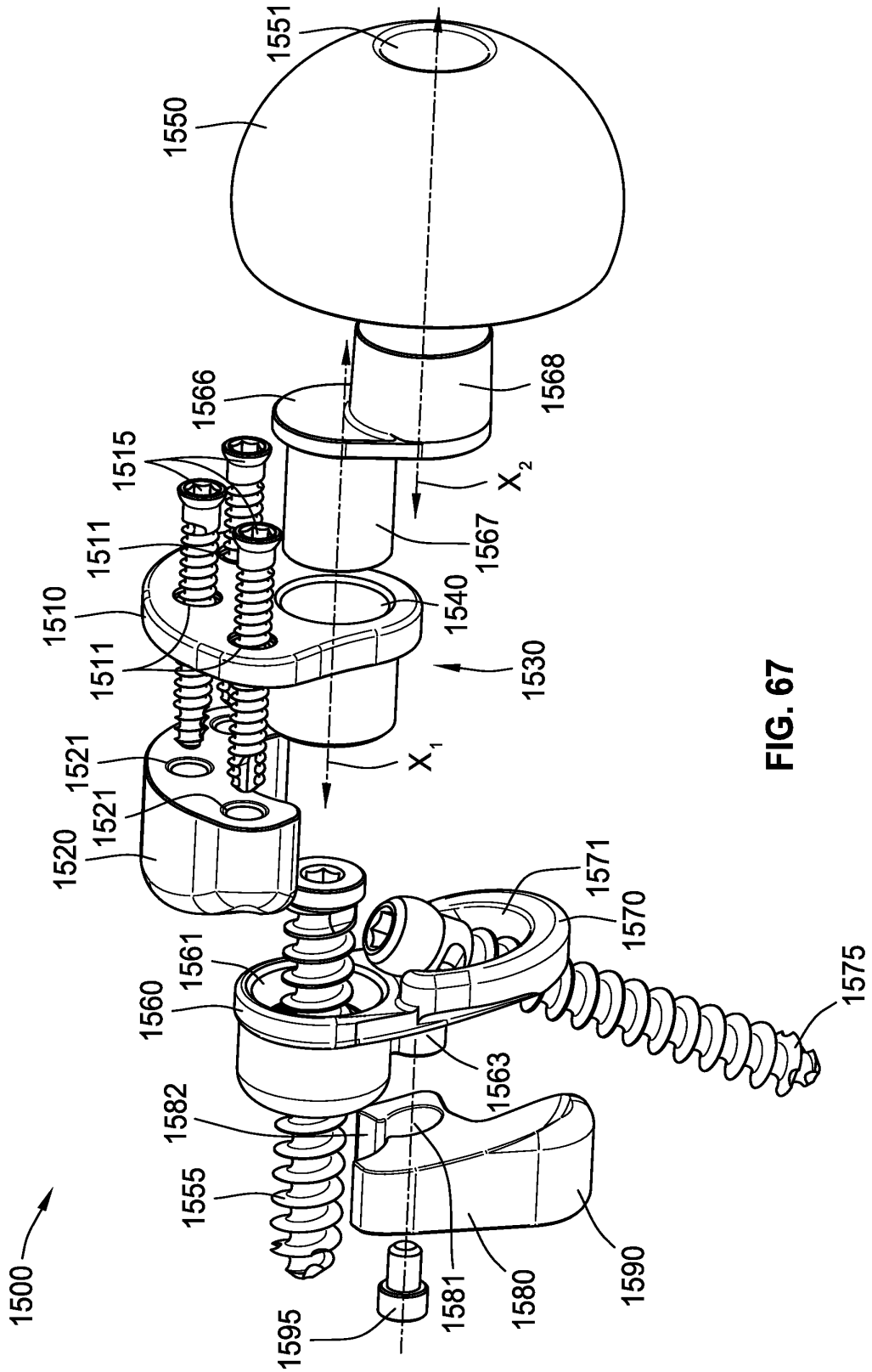

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X_1
X_2

FIG. 67

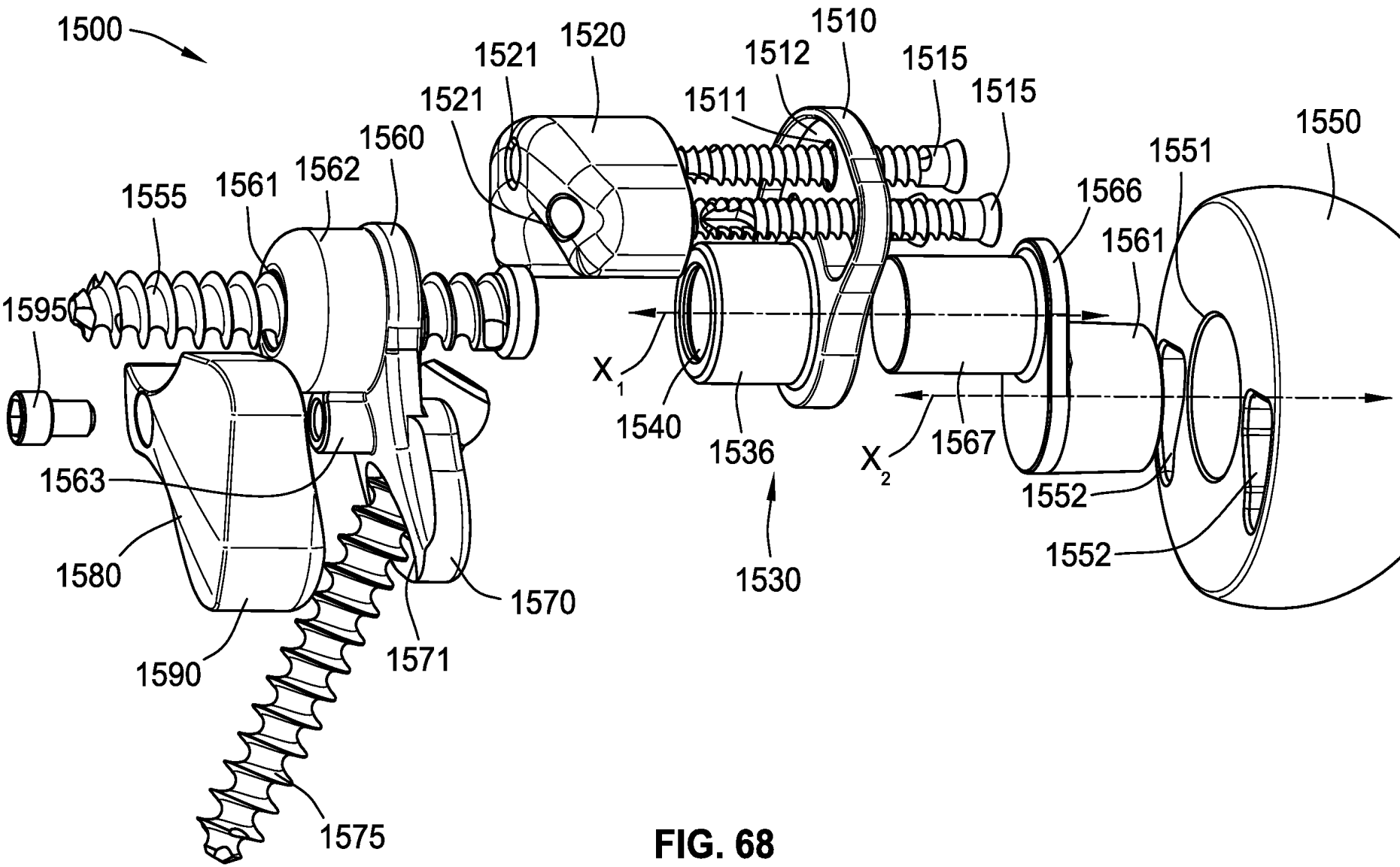

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X1
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X2
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FIG. 68

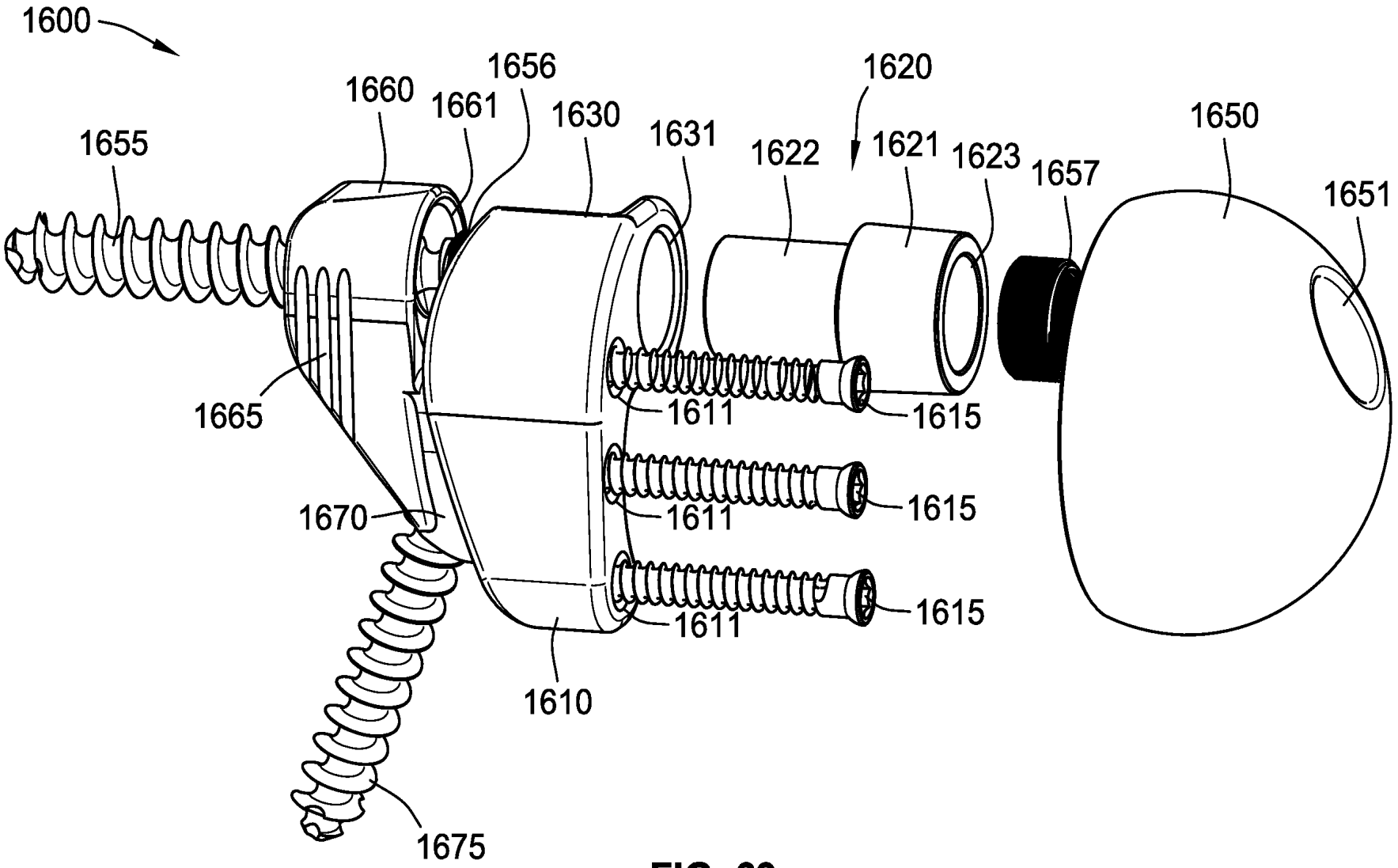

1600
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FIG. 69

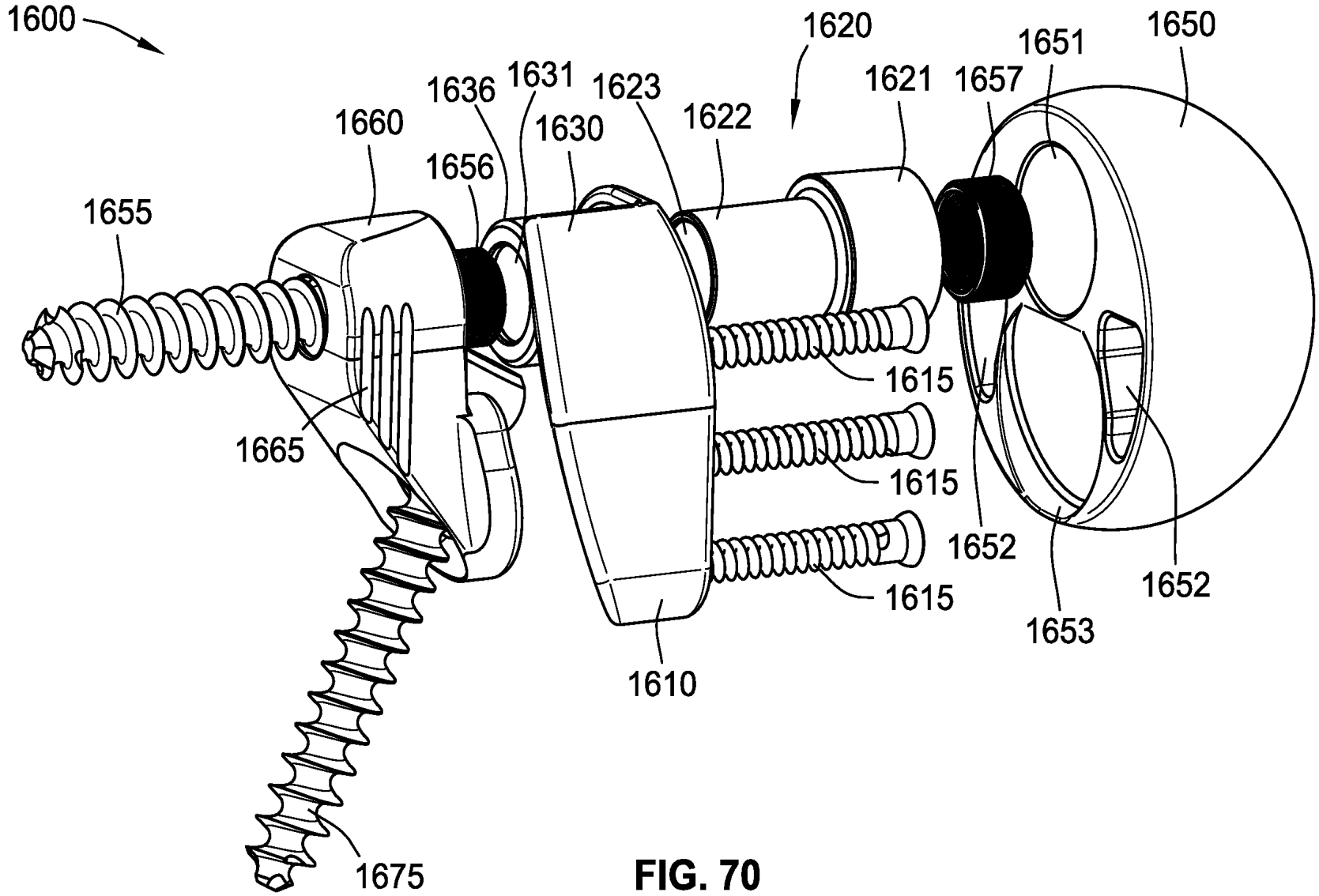

1600
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FIG. 70

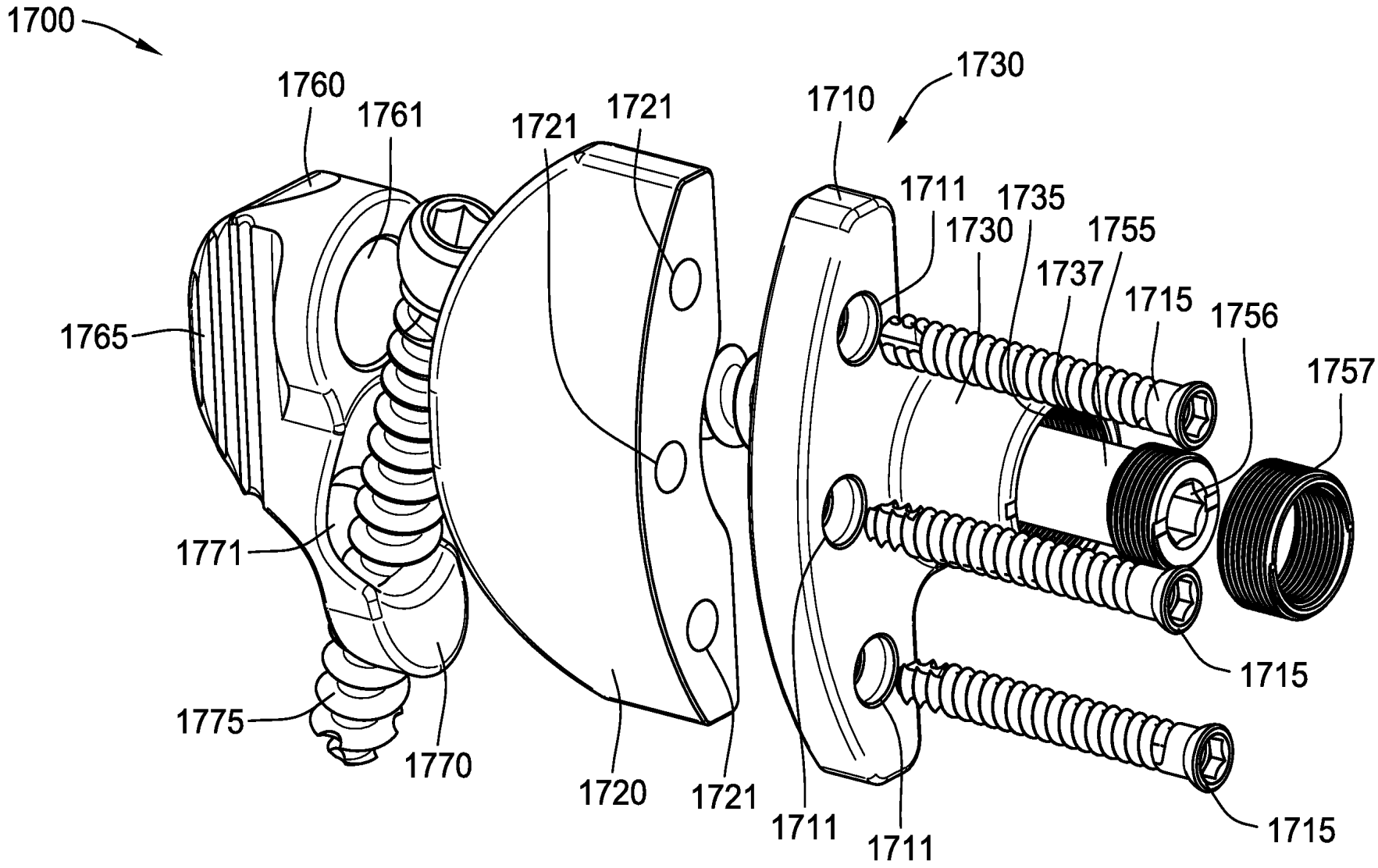

1700
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FIG. 71

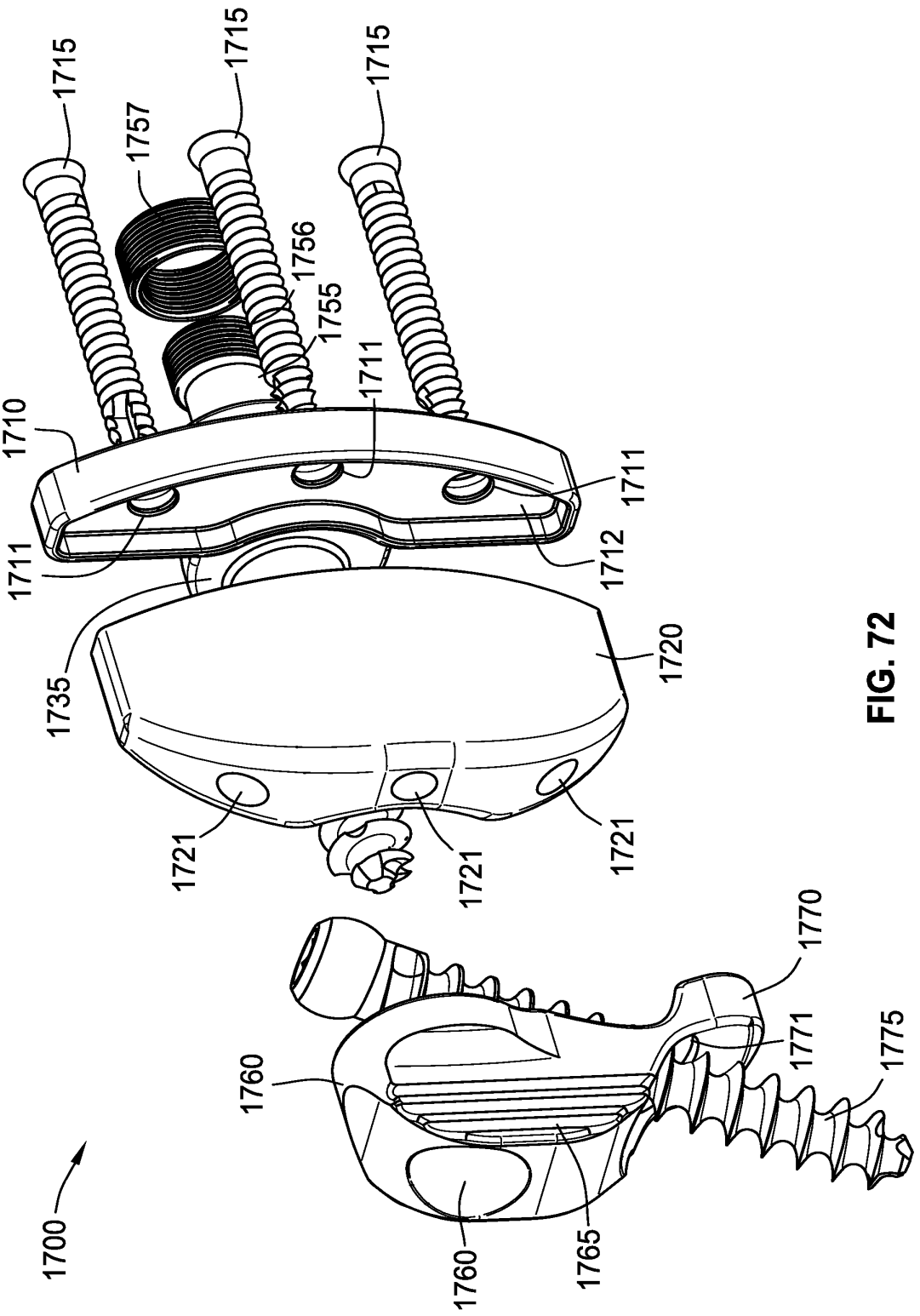

1700
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1770
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1775
1760
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FIG. 72

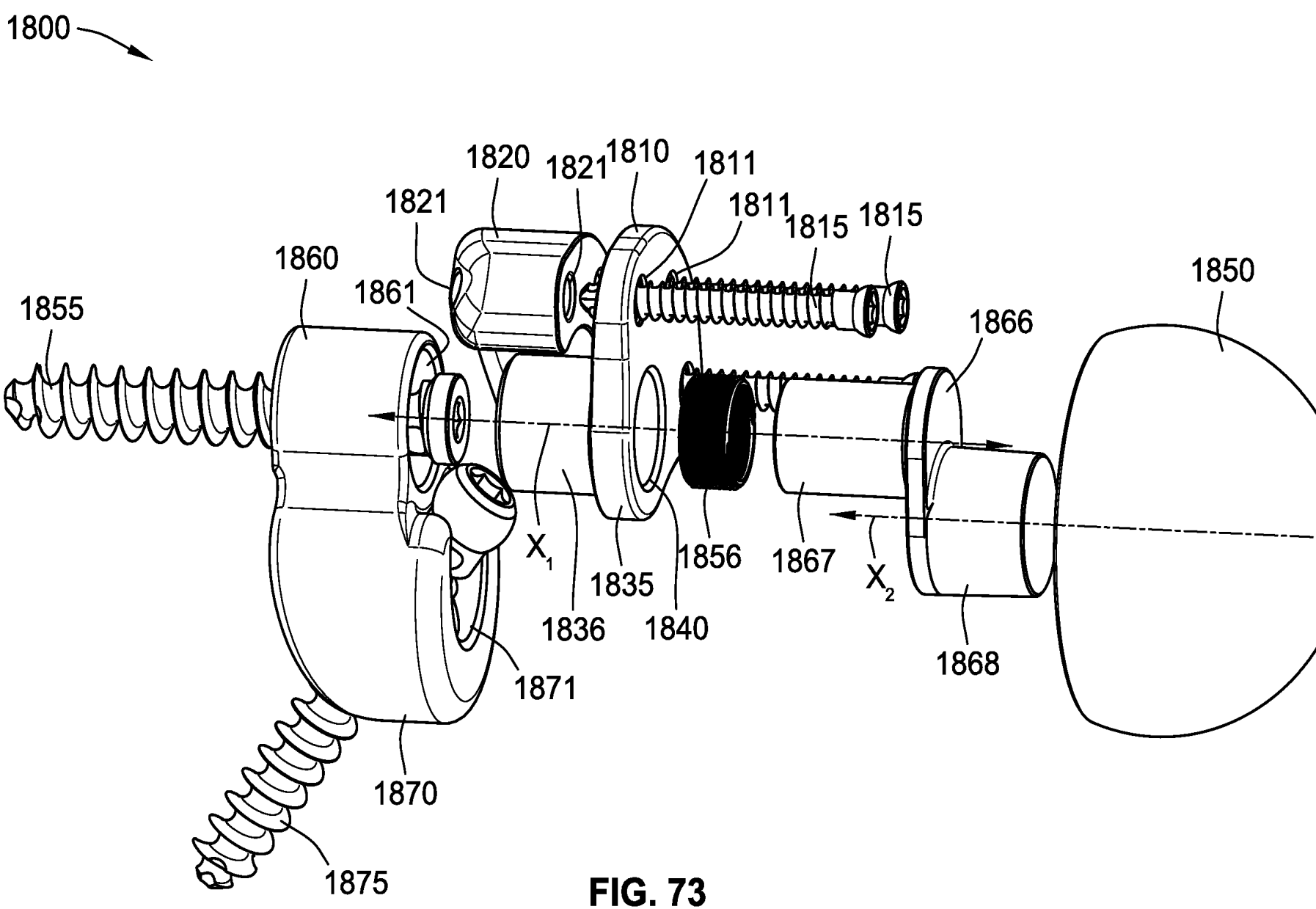

1800
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X_1
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1867
X_2
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1868
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1875

FIG. 73

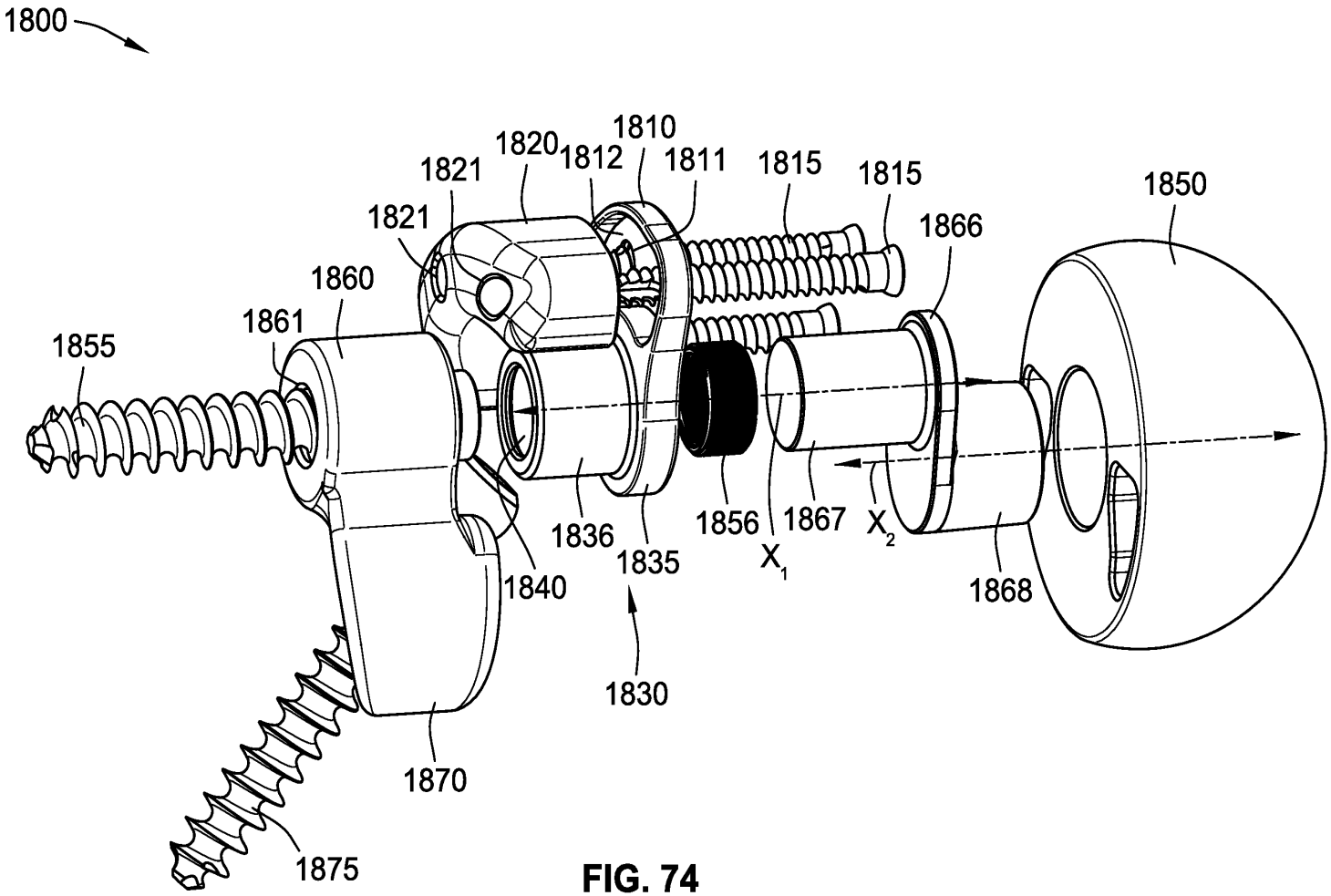

1800
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1856
1867
X_1
X_2
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FIG. 74

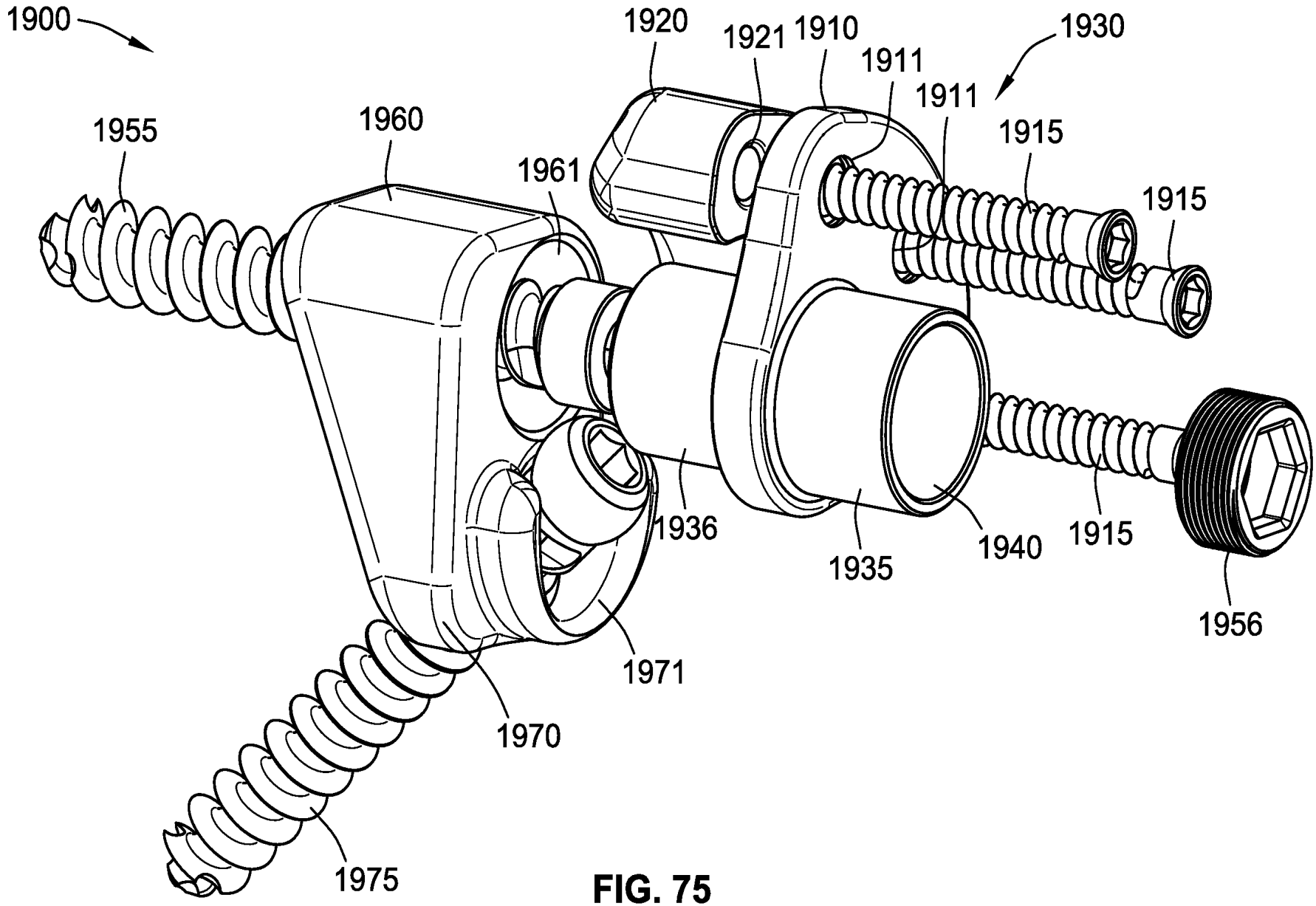

1900
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1915
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1970
1975

FIG. 75

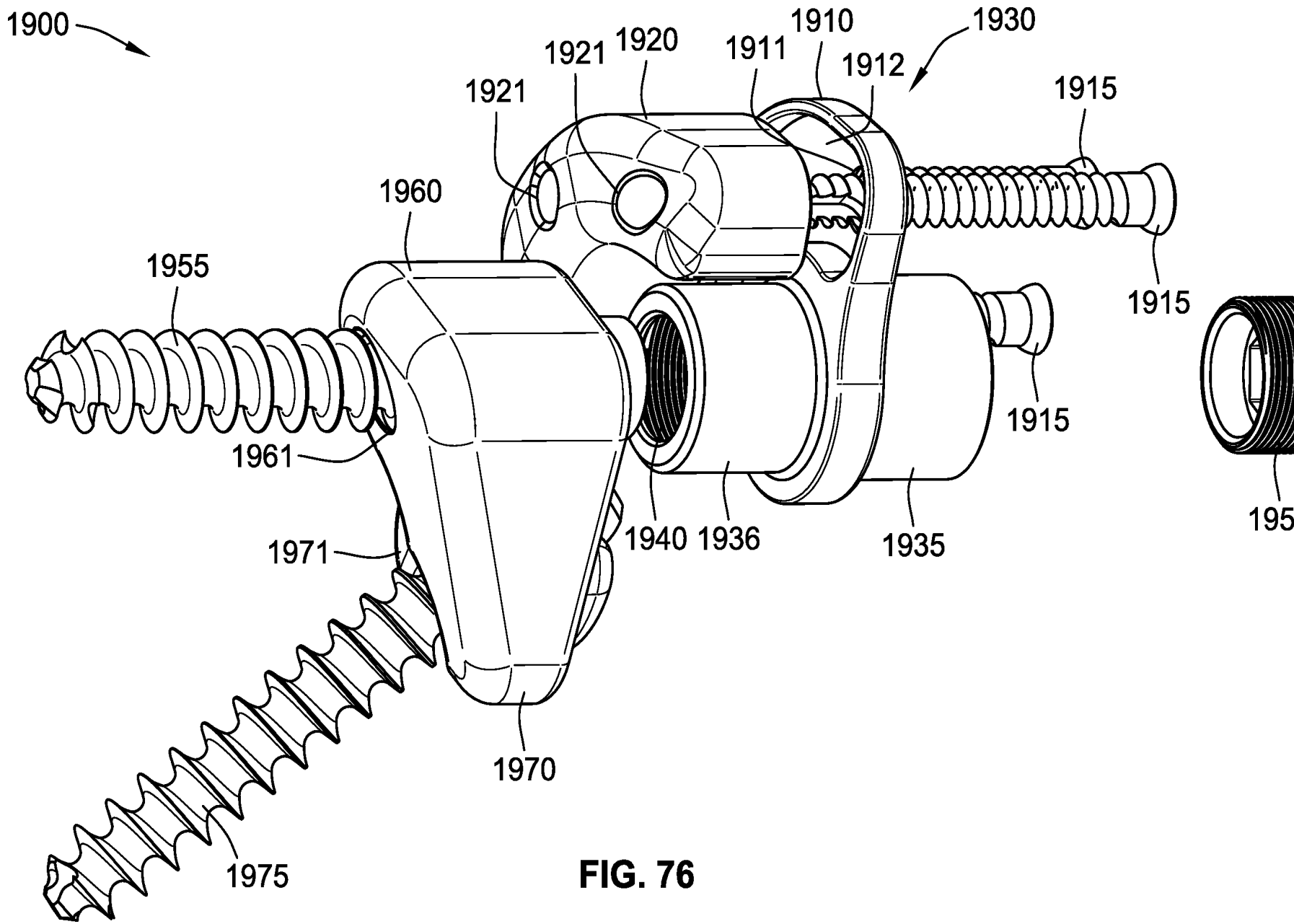

1900
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1960
1955
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1961
1971
1940
1936
1935
1970
1975

FIG. 76

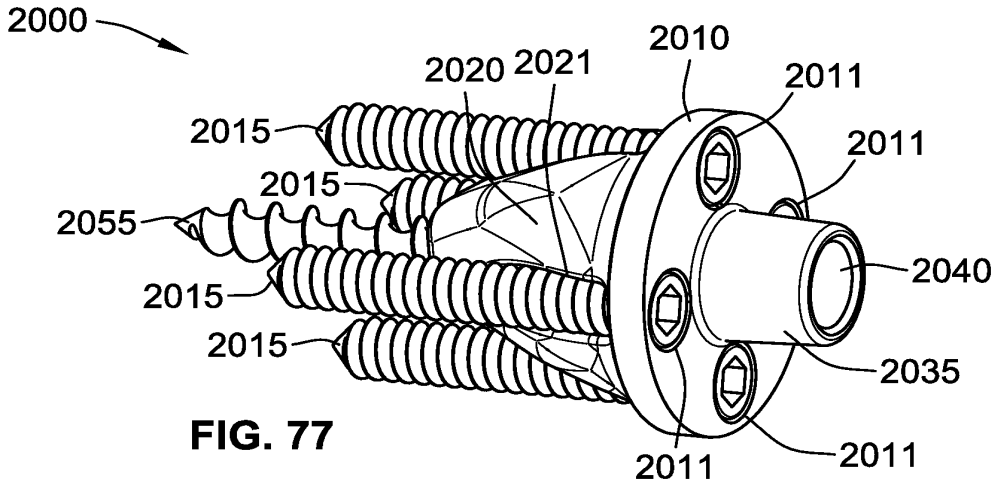


FIG. 77

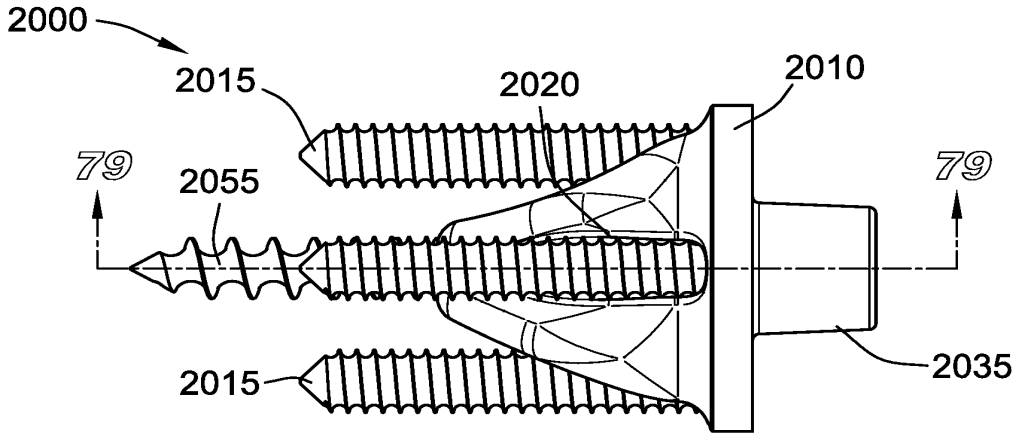


FIG. 78

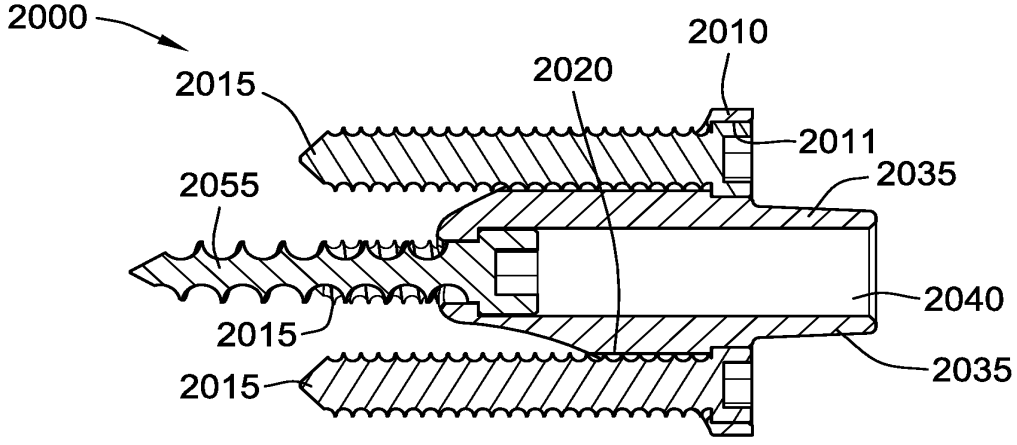


FIG. 79

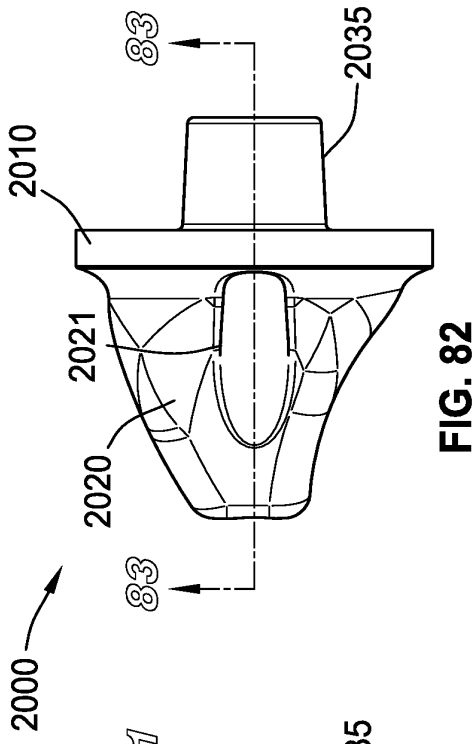


FIG. 82

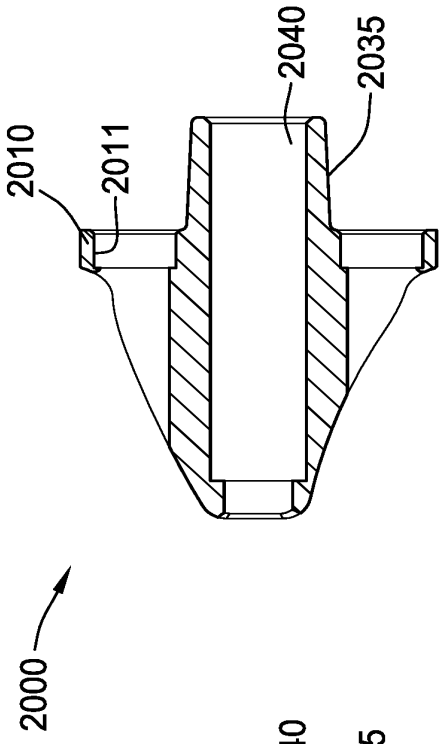


FIG. 83

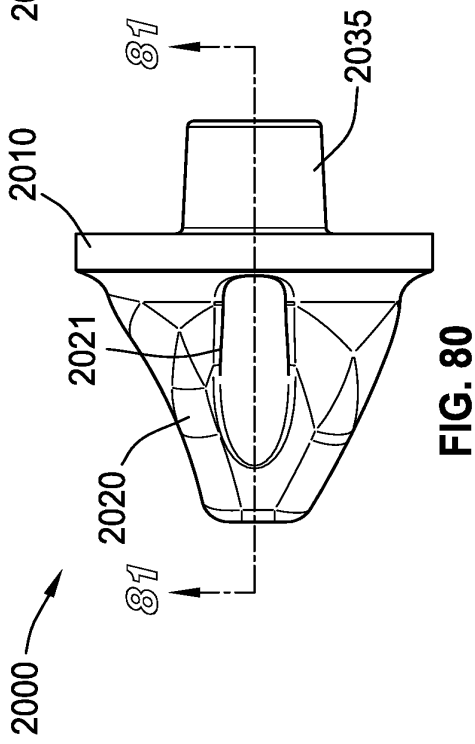


FIG. 80

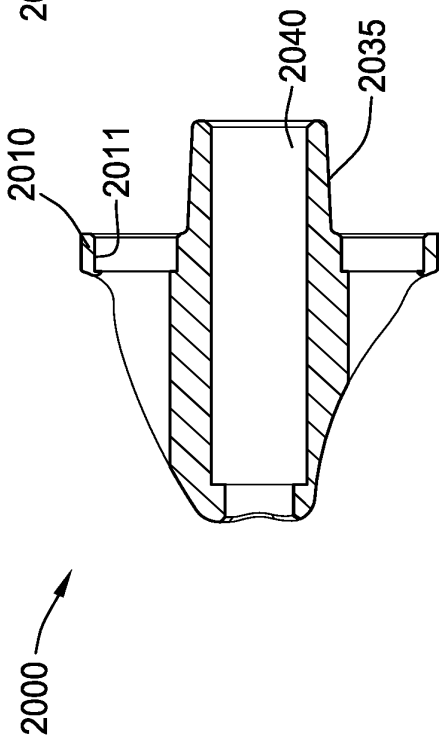


FIG. 81

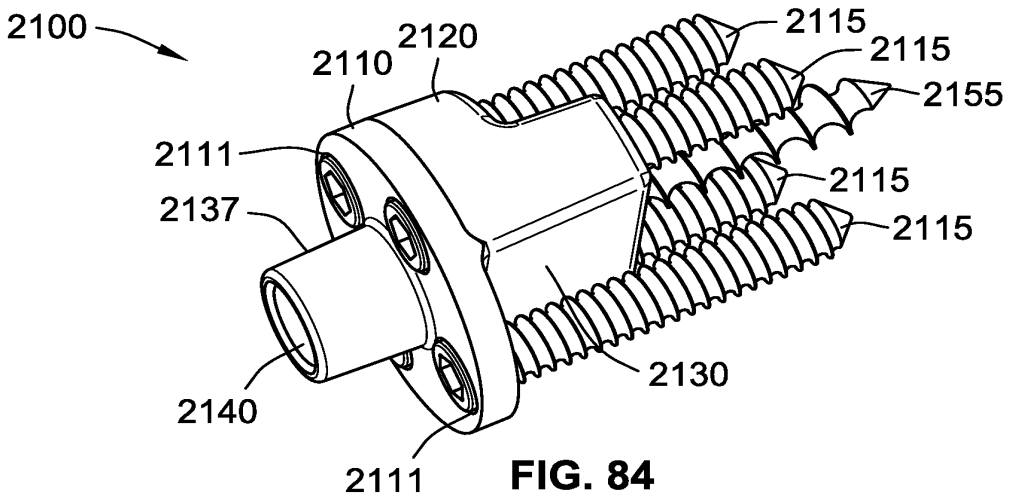


FIG. 84

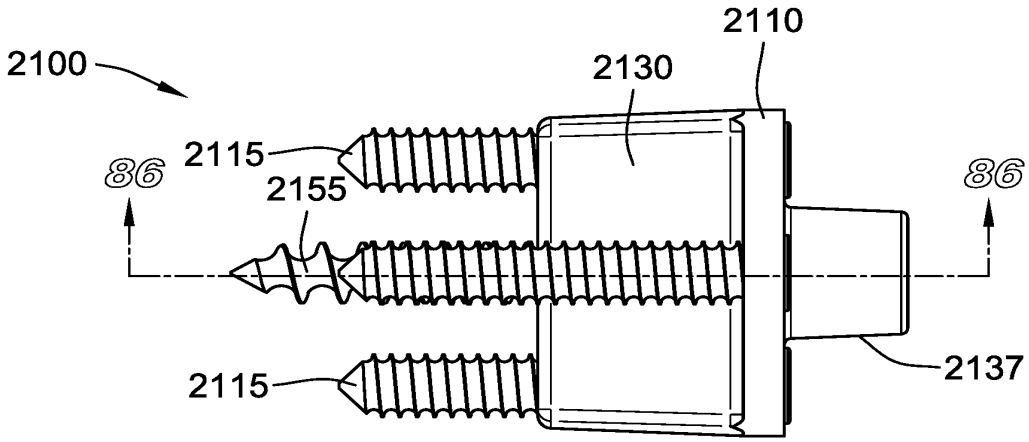


FIG. 85

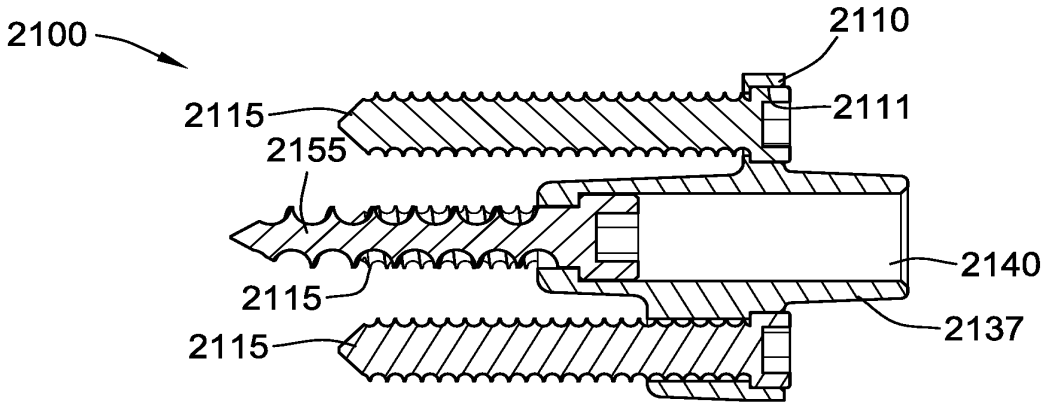


FIG. 86

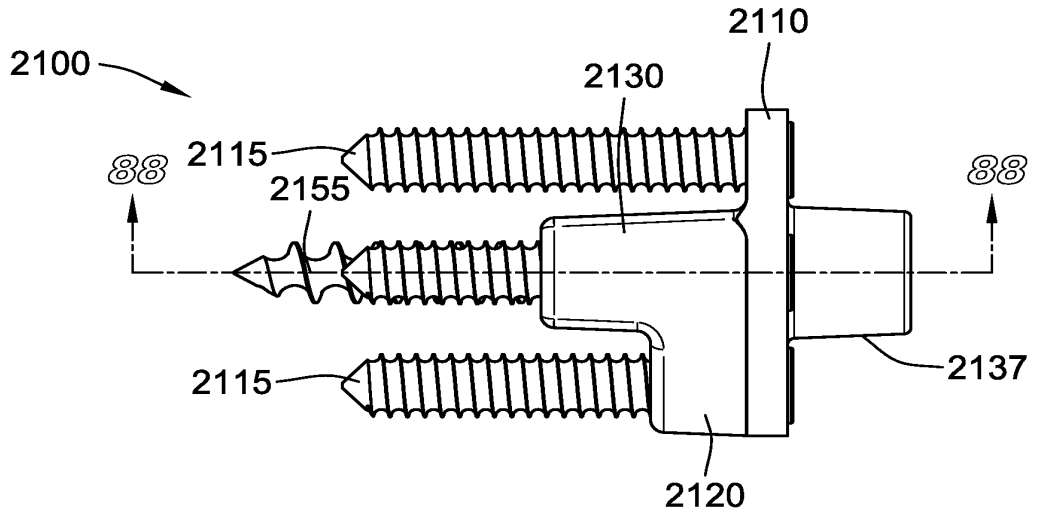

2100
2110
2130
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2137
2120

FIG. 87

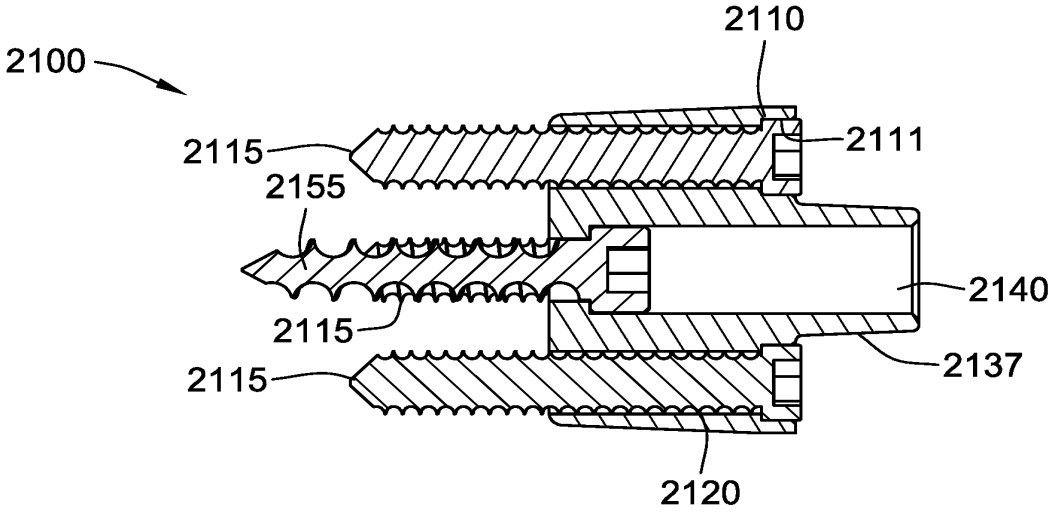

2100
2110
2115
2111
2155
2140
2115
2115
2137
2120

FIG. 88

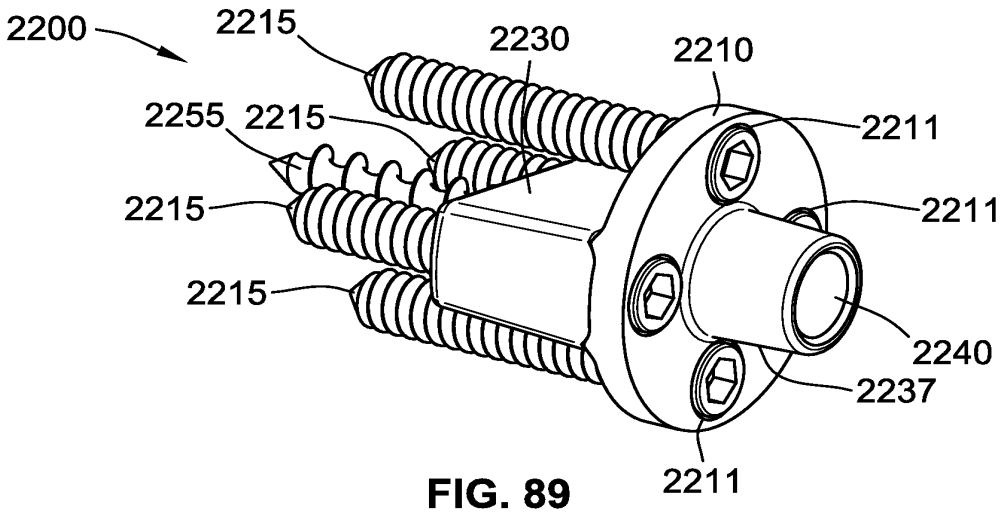


FIG. 89

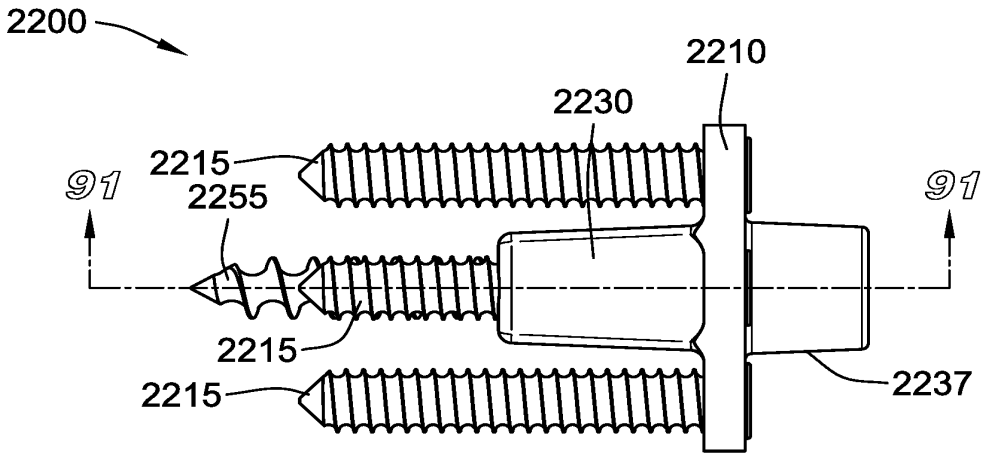


FIG. 90

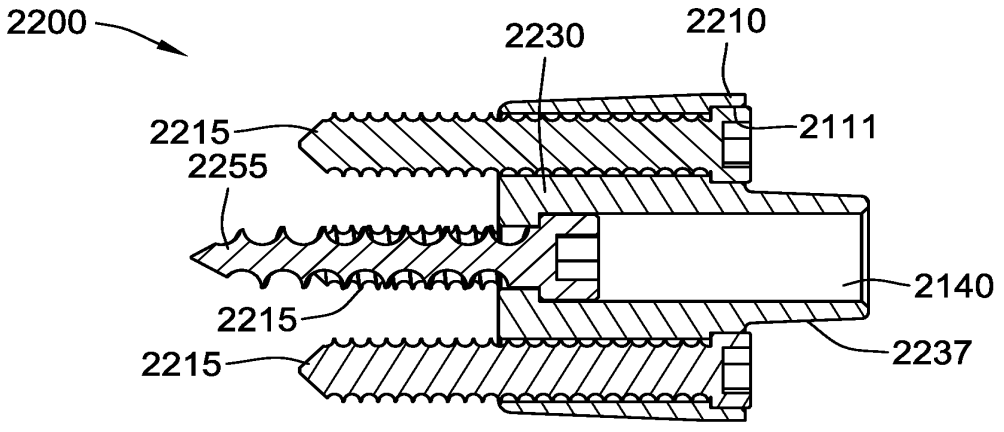


FIG. 91

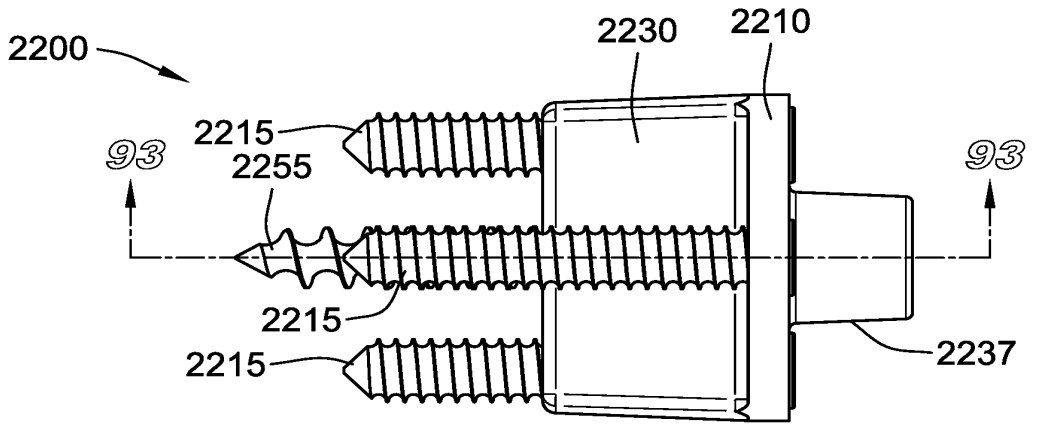

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FIG. 92

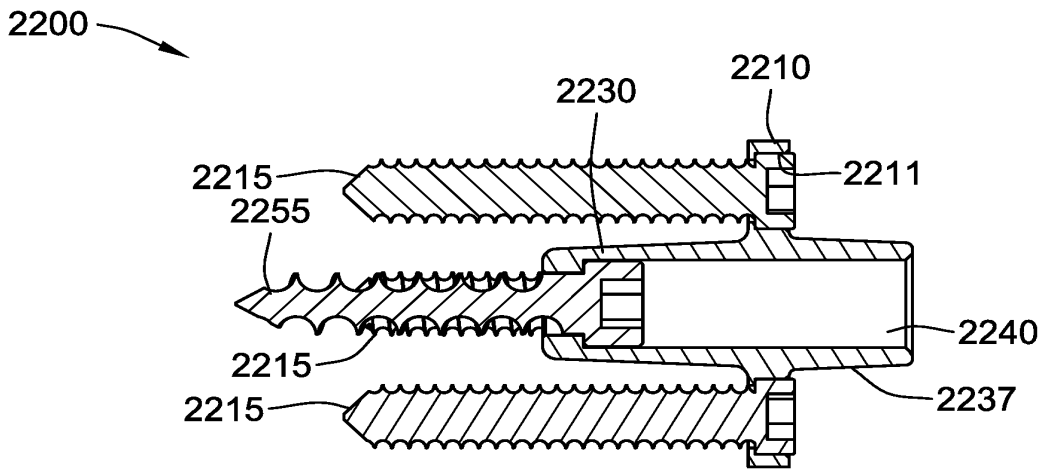

2200
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2240
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FIG. 93

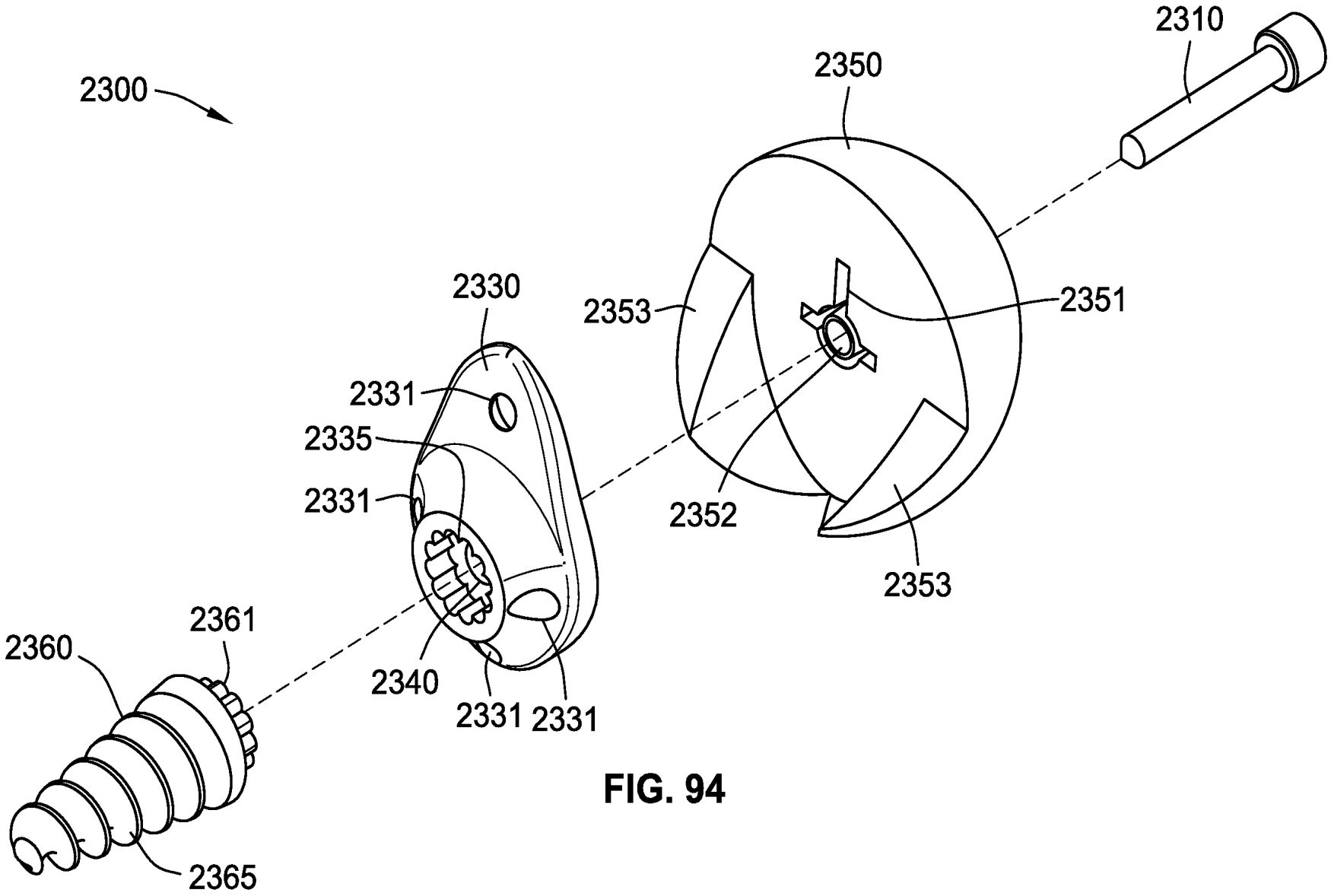

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FIG. 94

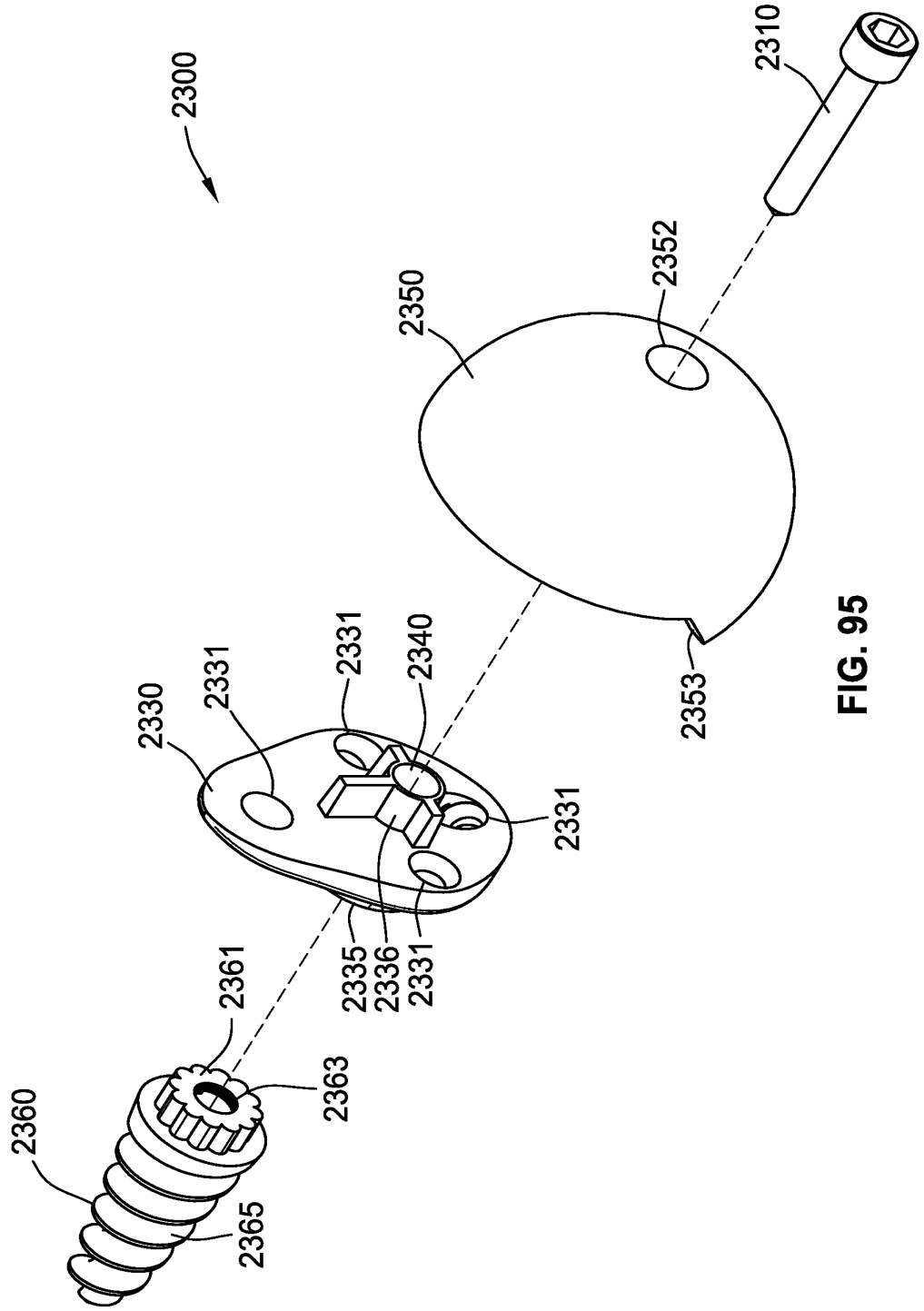

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FIG. 95

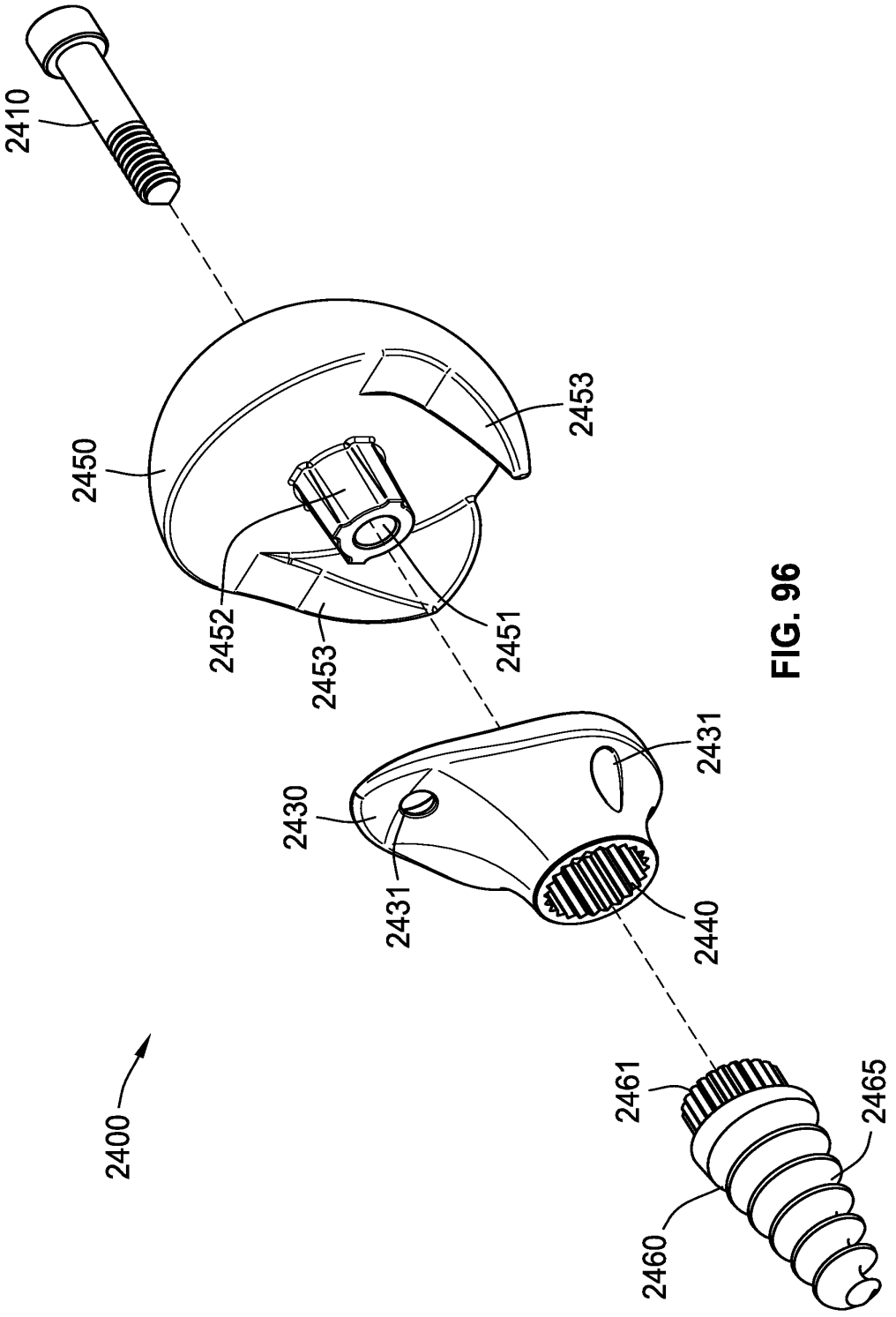

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FIG. 96

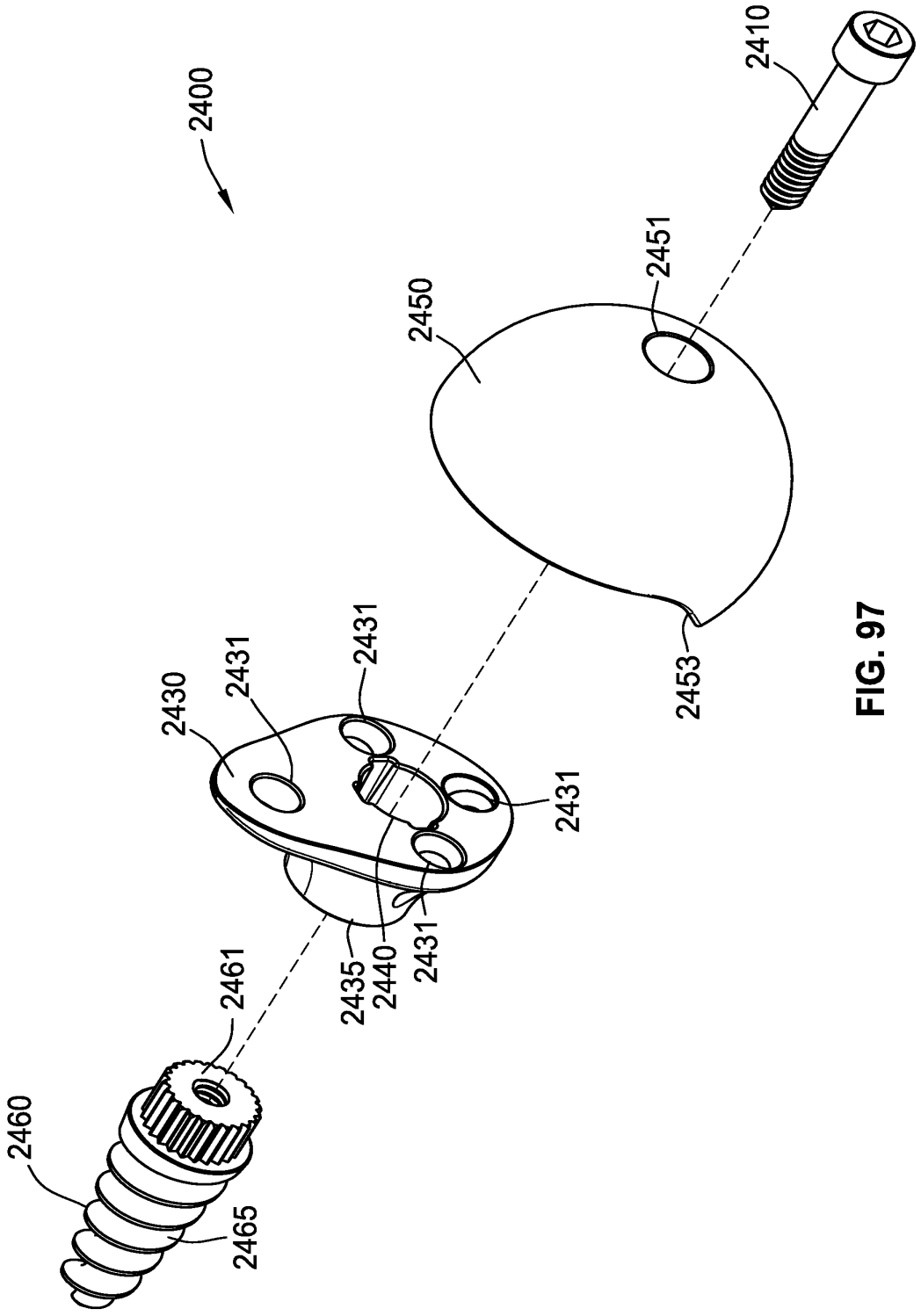

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FIG. 97

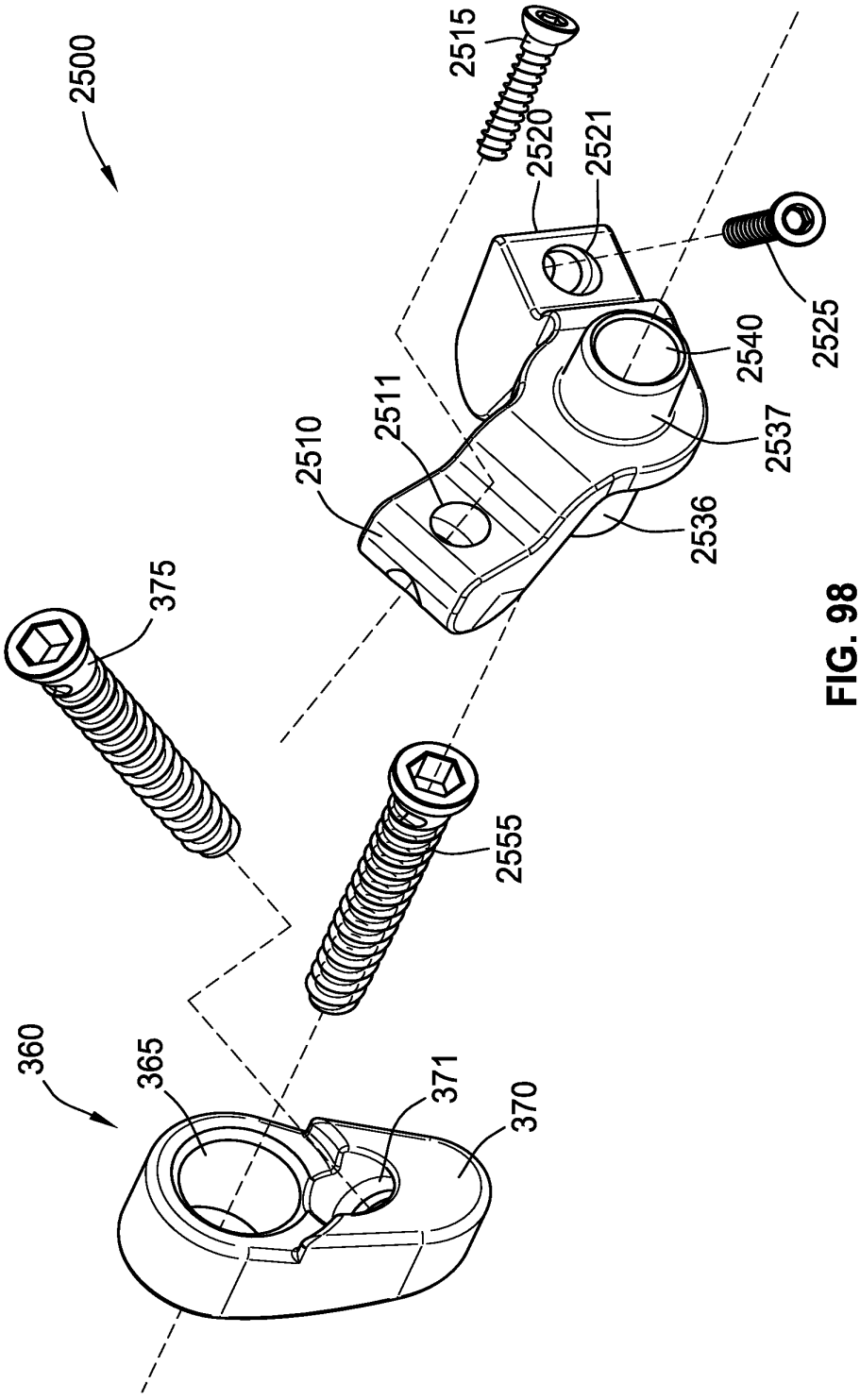

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FIG. 98

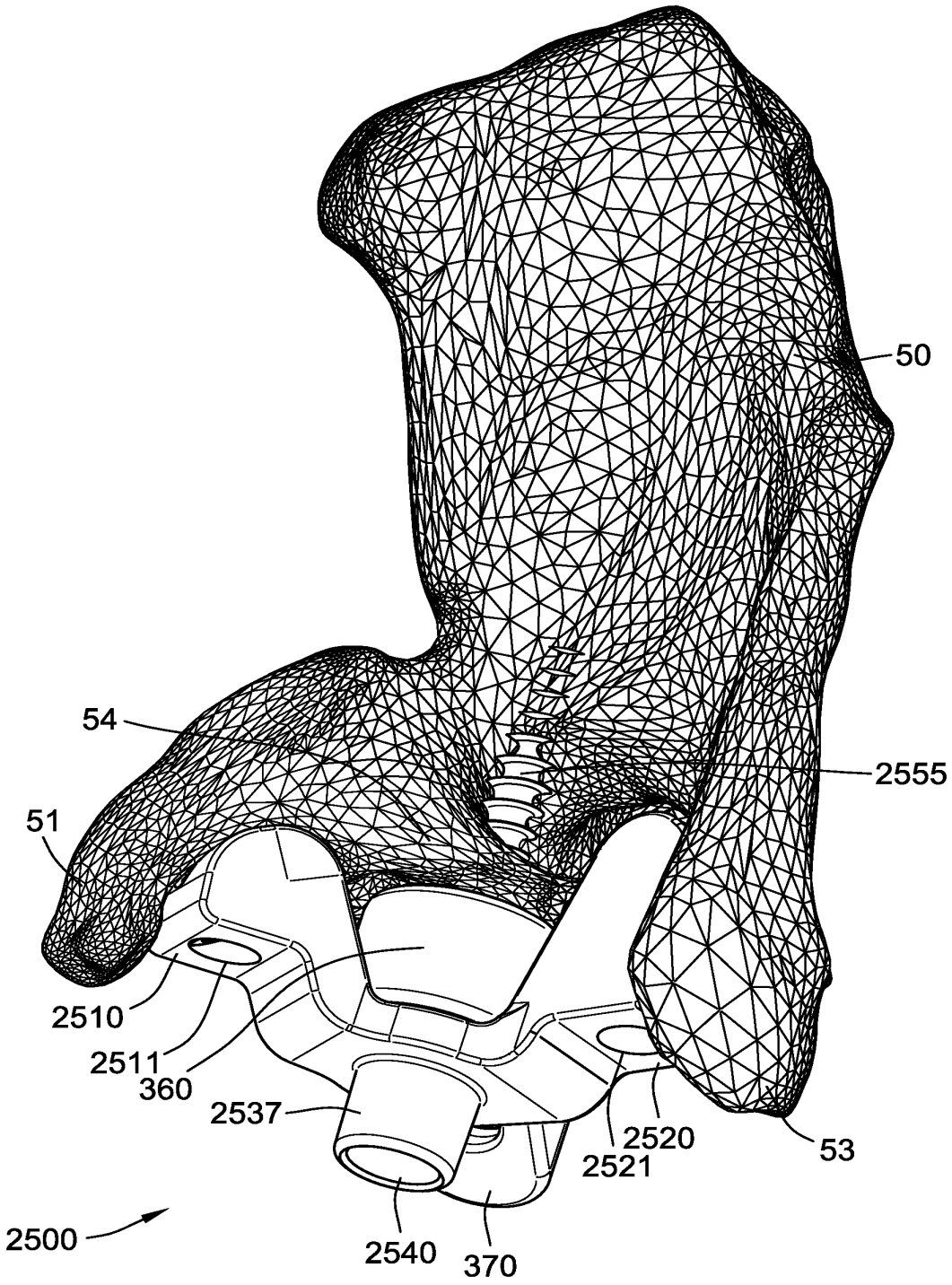


FIG. 99

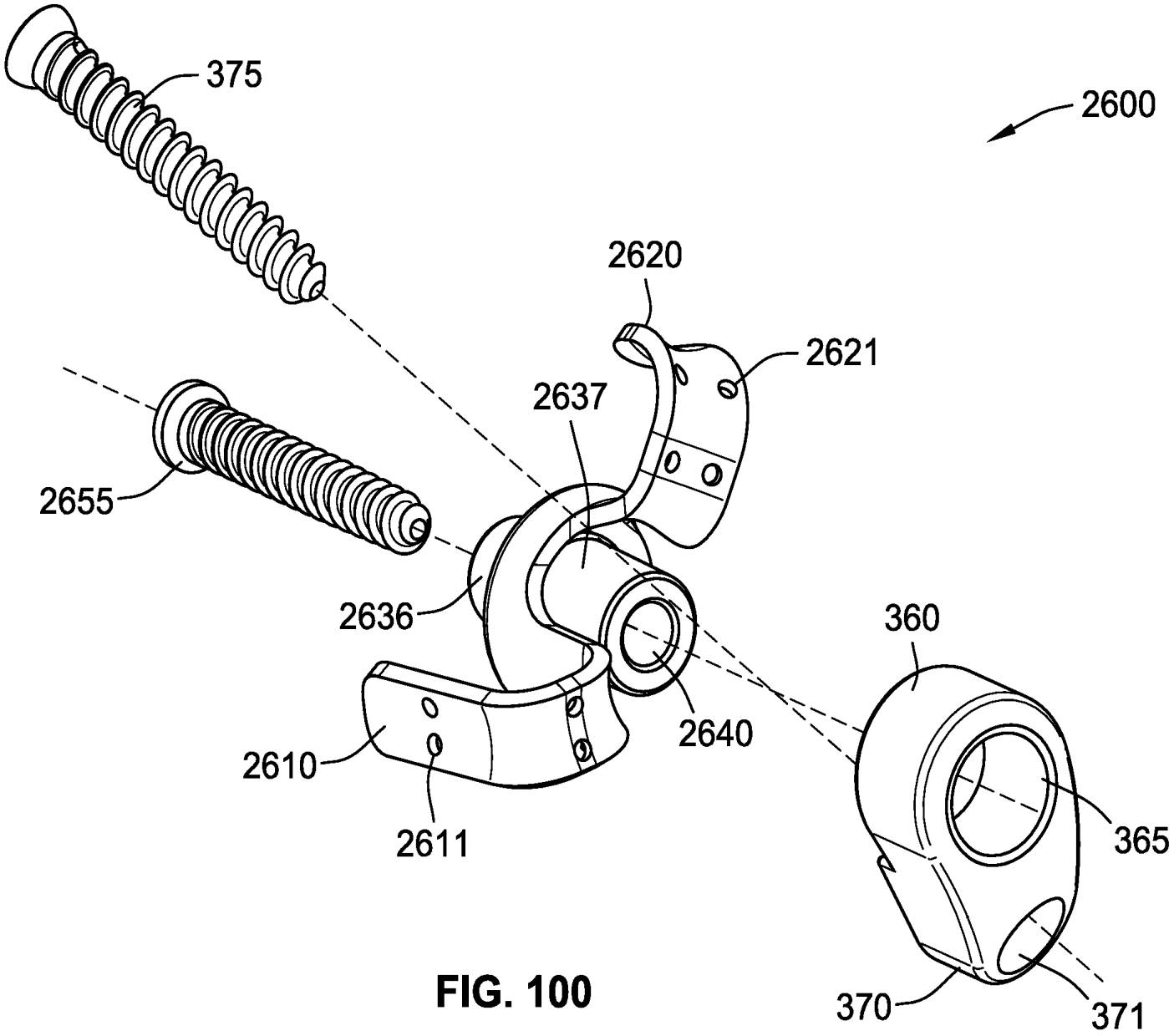

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FIG. 100

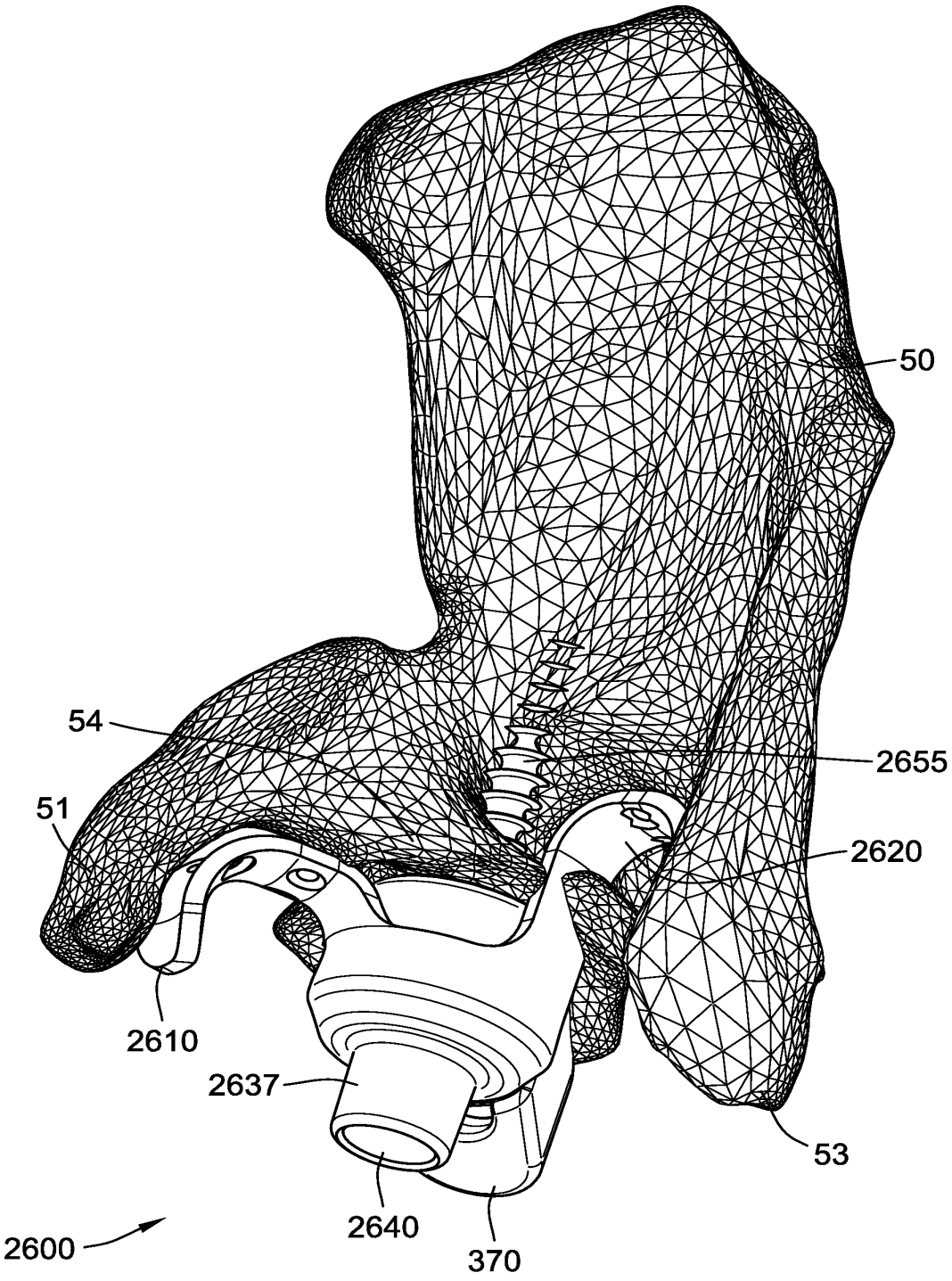


FIG. 101

Electronic Patent Application Fee Transmittal	
Application Number:	
Filing Date:	
Title of Invention:	GLENOID IMPLANT
First Named Inventor/Applicant Name:	Mark A. Frankle
Filer:	Bradley Michael Taub
Attorney Docket Number:	294564-001011PL01
Filed as Large Entity	
Filing Fees for Provisional	

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
PROVISIONAL APPLICATION FILING	1005	1	280	280
Pages:				
PROV. APPL SIZE FEE PER 50 SHEETS >100	1085	1	400	400
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**680**

Electronic Acknowledgement Receipt	
EFS ID:	34978289
Application Number:	62797866
International Application Number:	
Confirmation Number:	7468
Title of Invention:	GLENOID IMPLANT
First Named Inventor/Applicant Name:	Mark A. Frankle
Customer Number:	70001
Filer:	Bradley Michael Taub
Filer Authorized By:	
Attorney Docket Number:	294564-001011PL01
Receipt Date:	28-JAN-2019
Filing Date:	
Time Stamp:	19:42:36
Application Type:	Provisional

Payment information:

Submitted with Payment	yes
Payment Type	DA
Payment was successfully received in RAM	$680
RAM confirmation Number	012919INTEFSW00007049504181
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Specification	294564-001011PL01_Patent_Application.pdf	333698 5952f29001dcd5a013417304468c99830d5647a6	no	80
Warnings:					
Information:					
2	Application Data Sheet	294564-1011PL01_ADS.pdf	1822317 589b9094a2246399124d58a6ca60927e7ae26528	no	9
Warnings:					
Information:					
3	Drawings-only black and white line drawings	294564-001011PL01-DRAWINGS.pdf	2850525 72a5d6ccfbde963ec8160aa6d7ff2ba5f16b9229	no	76
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4	Fee Worksheet (SB06)	fee-info.pdf	31610 7ad7313b139a8c1f682e18a7574b8d239d962c18	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5038150		

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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.

GLENOID IMPLANT

FIELD OF THE PRESENT DISCLOSURE

[0001] The present disclosure relates to glenoid implants for cases of severe bone loss.

BACKGROUND

[0002] Shoulder replacement surgery is currently used to treat patients suffering from disabling pain due to worn or damaged shoulder joints, which can be caused by, e.g., arthritis and/or injury. The humeral implants currently in use are typically made from metal, and the implants are affixed to the bone using bone cement (e.g., polymethylmethacrylate) or by press fitting the implant into the bone using a roughened outer surface coating on the metal for bony integration. Most glenoid (shoulder socket) implants are made completely from polyethylene and affixed to the cortical bone using bone cement. Some glenoid implants have a metal baseplate with a polyethylene insert. Current glenoid implants are made to sit on the surface of a reamed glenoid, which is prepared by removing any remaining cartilage and flattening the bony surface. These implants use either a keel or multiple elongated pegs on the back of the prosthetic glenoid implant to secure the glenoid implant inside the glenoid vault.

[0003] Keeled and pegged glenoid implants suffer from several disadvantages, which limit their lifespan once implanted and reduce the number of indications for which they can be used when the age of the patient is a factor. For example, the glenoid implants can loosen due to poor fixation within the bone, and they are prone to wear and fatigue failure of the polyethylene due to adhesion, abrasion, and shear stress. Because of these deficiencies, surgeons hesitate to perform glenoid replacement surgery on young or middle aged patients with glenoid articular cartilage injuries or damage due to early arthritis for fear that the implant may not last more than 10-15 years in the body, thus subjecting the patient to the possibility of two or more

surgeries during the lifetime of the patient to preserve the function and pain-free state of the joint. Finally, current glenoid implants with a long keel or pegs are sometimes contraindicated in patients with significant glenoid bone loss. As arthritis progresses, the humeral head can wear medially and destroy the foundation of glenoid bone. In these cases, the glenoid vault can be significantly reduced in volume and depth. Thus, a typical keel or peg design can broach the glenoid vault and injure the suprascapular nerve along the suprascapular notch or spinoglenoid notch with resultant denervation injury to the rotator cuff muscles. Broaching through the glenoid vault can also fracture the body of the scapula and cause early implant loosening.

[0004] Because there are more than 20,000 shoulder arthoplasty surgeries performed per year, many U.S. patients incur a risk of continued pain and disability, neuromuscular injuries, or failed shoulder prostheses requiring revision surgery. Thus, there remains a need for an improved glenoid implants. The present disclosure is directed to solving these problems and addressing other needs.

SUMMARY OF THE PRESENT DISCLOSURE

[0005] According to some implementations of the present disclosure, a glenoid implant includes a baseplate, a first leg and a second leg. The baseplate includes a central aperture therethrough. The first leg extends from the baseplate generally along a first arc. The first leg includes a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient. The second leg extends from the baseplate generally along a second arc. The second leg includes a second aperture therein configured to receive a portion of a second fastening

element therethrough to aid in securing the second leg to a second portion of the scapula of the patient.

[0006] In some implementations, a radius of curvature for the first arc is larger than a radius of curvature for the second arc. In an alternative implementation, a radius of curvature for the first arc is the same as a radius of curvature for the second arc. In an alternative implementation, a radius of curvature for the second arc is larger than a radius of curvature for the first arc. The first portion of the scapula of the patient can be an Acromion. The second portion of the scapula of the patient can be a Coracoid.

[0007] The glenoid implant can also include a third leg extending from the baseplate generally along a third arc. The third leg can have a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient. In some implementations, a radius of curvature for the third arc is smaller than a radius of curvature for the second arc and a radius of curvature for the first arc. In some alternative implementations, the radius of curvature for the third arc is the same as a radius of curvature for the second arc and a radius of curvature for the first arc. The third portion of the scapula of the patient can be an Infraglenoid tubercle (also referred to as the lateral boarder of the scapula) and/or the For Subscapularis.

[0008] In some implementations, the baseplate includes a first portion coupled to a second portion such that the central aperture is defined by both the first portion and the second portion. The first portion of the baseplate, the first leg, and the second leg can form a first monolithic part. Furthermore, the second portion of the baseplate and the third leg can form a second monolithic part that is separate and distinct from the first monolithic part.

[0009] In some implementations, the first leg, the second leg, and the third leg are curved to account for curvature of the first portion, second portion, and third portion of the scapula of the patient. The first leg, the second leg, and the third leg can extend generally along the first

arc, the second arc, and the third arc, respectively, such that each of the first leg, the second leg, and the third leg has a radius of curvature.

[0010] The radius of curvature of the first leg, the second leg, and the third leg can aid in a substantial portion of the glenoid implant directly abutting the first portion, second portion, and third portion, respectively, of the scapula of the patient. In some implementations, at least seventy-five percent of a rear surface of the glenoid implant directly abuts the scapula of the patient prior to bone grafting material being applied. In some implementations, the first leg is longer than the second leg and the third leg.

[0011] The glenoid implant can also include a central fastening element configured to be at least partially positioned through the central aperture of the baseplate to aid in securing the baseplate to a fourth portion of the scapula of the patient. The fourth portion of the scapula of the patient can be a glenoid cavity. In some implementations of the disclosure, a head of the central fastening element is configured to be coupled with one or more additional components using a Morse taper press fit. The head of the central fastening element can be configured to be coupled with a humeral head. In alternative implementations, the central fastening element includes a compression screw. In further alternative implementations of the disclosure, the central fastening element includes a lock screw.

[0012] In some implementations, the first fastening element and the second fastening element are configured to provide the glenoid implant with bi-cortical support. In alternative implementations of the present disclosure, the first fastening element and the second fastening element are configured to provide the glenoid implant with uni-cortical support.

[0013] According to some implementations of the present disclosure, a glenoid implant includes a baseplate, a first leg and a second leg. The baseplate includes a central aperture therethrough. The first leg extends from the baseplate in a first direction. The first leg includes a first aperture therein configured to receive a portion of a first fastening

element therethrough to aid in securing the first leg to a first portion of a scapula of a patient. The second leg extends from the baseplate in a second direction. The second leg includes a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient.

[0014] According to some implementations of the present disclosure, a glenoid implant includes a base, a first leg a second leg, and an adjustable third leg. The base includes a first portion and a second portion. The first portion includes a first aperture therethrough and the second portion having a second aperture therethrough. The first aperture is configured to align with the second aperture to define a central aperture of the base, responsive to the first portion being coupled to the second portion.

[0015] The first leg extends from the first portion of the base generally along a first arc. The first leg includes a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient. The second leg extends from the first portion of the base generally along a second arc. The second leg includes a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient. The adjustable extends from the second portion of the base generally along a third arc responsive to the first portion being coupled to the second portion. The third leg having a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient.

[0016] According to some implementations of the present disclosure, a glenoid implant includes a base element, a coupling element and an augment. The base element includes a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element. The keel element is configured to secure the base element to a first portion of a scapula of a patient. The second aperture is configured

to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient. The coupling element includes a first elongated portion and a second portion. The first elongated portion includes a plurality of apertures therethrough and the second portion includes a central aperture aligned with the central aperture of the base element.

[0017] The augment is configured to be received within a receiving space of the first elongated portion of the coupling element. The augment includes a second plurality of apertures therethrough. Each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient. Once coupled, the coupling element and the augment is configured to rotate about the base element.

[0018] According to some implementations of the disclosure, a glenoid implant includes a base element and a coupling element. The base element includes a central aperture therethrough and a second aperture therethrough. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in coupling the base element to a first portion of a scapula of a patient. The coupling element includes a plurality of apertures therethrough and a central aperture aligned with the central aperture of the base element. Each aperture of the plurality of apertures is configured to receive a portion of a second fastening element therethrough to aid in securing the coupling element to a second portion of the scapula of the patient. The coupling element is configured to rotate about the base element.

[0019] According to some implementations of the disclosure, a glenoid implant includes a base element, a coupling element, and an augment. The base element includes a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element. The keel element is configured to secure the base element to a first

portion of a scapula of a patient. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient. The coupling element includes a first elongated portion and a second portion. The first elongated portion includes a plurality of apertures therethrough. The second portion includes a central aperture aligned with the central aperture of the base element.

[0020] The augment is configured to be received within a receiving space of the first elongated portion of the coupling element. The augment includes a second plurality of apertures therethrough. Each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient. Once coupled, the coupling element and the augment are configured to rotate about the base element.

[0021] According to some implementations of the disclosure, a glenoid implant includes a base element, a coupling element, and an augment. The base element includes a central aperture therethrough, a second aperture therethrough, and a male receiving element on a rear end of the base element. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in coupling the base element to a first portion of a scapula of a patient. The coupling element includes a first elongated portion and a second portion. The first elongated portion includes a plurality of apertures therethrough. The second portion includes a central aperture aligned with the central aperture of the base element. The augment is configured to be received within a receiving space of the first elongated portion of the coupling element. The augment includes a second plurality of apertures therethrough. Each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing

the coupling element and the augment to a second portion of the scapula of the patient. Once coupled, the coupling element and the augment are configured to rotate about the base element.

[0022] According to some implementations of the disclosure, a glenoid implant includes a base element, a removable wedge element, a central fastening element, and a glenosphere. The base element includes a central aperture therethrough, a second aperture therethrough, and a male receiving element on a rear end of the base element. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to a first portion of a scapula of a patient. The removable wedge element includes an aperture. The aperture is configured to receive the male receiving element of the base element and a third fastening element therethrough to aid in securing the removable wedge element to the base element. The central fastening element is configured to be at least partially positioned through the central aperture of the base element to aid in securing the base element to the first portion of the scapula of the patient. The glenosphere is configured to be coupled to the base element via the central fastening element.

[0023] According to some implementations of the disclosure, a glenoid implant includes a base element and a coupling element. The base element includes a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element. The keel element is configured to secure the base element to a first portion of a scapula of a patient. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient. The coupling element includes a first elongated portion and a second portion. The first elongated body includes a plurality of apertures therethrough and the second portion includes a central aperture aligned with the central aperture of the base element. Each aperture of the plurality of apertures is configured to receive a portion of a second fastening element therethrough to aid in securing the coupling element to a second portion of the scapula of the

patient. The first elongated portion of the coupling element is positioned to a first side of the base element.

[0024] According to some implementations of the disclosure, a glenoid implant includes a base element, a coupling element, and an augment. The base element includes a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element. The keel element is configured to secure the base element to a first portion of a scapula of a patient. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient. The coupling element includes a first elongated portion and a second portion. The first elongated portion includes a plurality of apertures therethrough and the second portion includes a central aperture aligned with the central aperture of the base element. The augment is configured to be received within a receiving space of the first elongated portion of the coupling element. The augment includes a second plurality of apertures therethrough. Each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient. The coupling element and the augments are positioned to a first side of the base element.

[0025] According to some implementations of the disclosure, a glenoid implant includes a base element, a coupling element, and an augment. The base element includes a central aperture therethrough, a second aperture therethrough, and a wedge element extending from a rear of the base element. The wedge element is configured to secure the base element to a first portion of a scapula of a patient. The second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient. The coupling element includes a first elongated portion and a second portion. The first elongated portion includes a plurality of apertures therethrough and the

second portion includes a central aperture aligned with the central aperture of the base element. The augment is configured to be received within a receiving space of the first elongated portion of the coupling element. The augment includes a second plurality of apertures therethrough. Each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient.

[0026] According to some implementations of the disclosure, a glenoid implant includes a baseplate and a keel element extending from a rear of the baseplate. The baseplate includes a central aperture therethrough and a plurality of apertures therethrough. Each of the plurality of apertures are positioned around the central aperture. The keel element includes a central aperture aligned with the central aperture of the base element and a plurality of grooves. Each aperture of the plurality of apertures is aligned with each groove of the plurality of grooves to receive a portion of a second fastening element therethrough to aid in securing the wedge element to a first portion of a scapula of a patient. The keel element is shaped to account for a cavity defect of a first portion of a scapula of a patient.

[0027] According to some implementations of the disclosure, a glenoid implant includes a baseplate and a keel element extending from a rear of the baseplate. The baseplate includes a central aperture therethrough and a first plurality of apertures therethrough. Each of the plurality of apertures are positioned around the central aperture. The keel element includes a central aperture aligned with the central aperture of the base element and a second plurality of apertures. At least one aperture of the first plurality of apertures is aligned with at least one aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the wedge element to a first portion of a scapula of a patient.

[0028] According to some implementations of the disclosure, a glenoid implant includes a reverse face plate, a keel element, a glenosphere, and a central fastening element. The reverse

face plate includes a protrusion element with a first central aperture therethrough, a receiving element opposite the protrusion element, and a first plurality of apertures therethrough. Each of the plurality of apertures are positioned around the central aperture. The keel element includes a second central aperture, a threaded element to aid in securing the keel element to a first portion of a scapula of a patient, and a connecting element configured to couple with the receiving element of the reverse plate. The glenosphere includes a third central aperture and a receiving space configured to receive the protrusion element of the reverse face plate.

[0029] The central fastening element is configured to be at least partially positioned through the first central aperture of the reverse face plate, the second central aperture of the keel element, and the third central aperture of the glenosphere to aid in coupling the glenosphere to the reverse face plate and the keel element to the reverse face plate.

[0030] According to some implementations of the disclosure, a glenoid implant includes a reverse face plate, a keel element, a glenosphere, and a central fastening element. The reverse face plate includes a first receiving element with a first central aperture therethrough, a second receiving element opposite the first receiving element, and a first plurality of apertures therethrough. Each of the plurality of apertures are positioned around the first receiving element. The keel element includes a second central aperture, a threaded element to aid in securing the keel element to a first portion of a scapula of a patient, and a connecting element configured to couple with the second receiving element of the reverse plate. The glenosphere includes a third central aperture and a protrusion element configured to be received within the first receiving element of the reverse face plate. The central fastening element configured to be at least partially positioned through the first central aperture of the reverse face plate, the second central aperture of the keel element, and the third central aperture of the glenosphere to

aid in coupling the glenosphere to the reverse face plate and the keel element to the reverse face plate.

[0031] The foregoing and additional aspects and implementations of the present disclosure will be apparent to those of ordinary skill in the art in view of the detailed description of various embodiments and/or implementations, which is made with reference to the drawings, a brief description of which is provided next.

BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The foregoing and other advantages of the present disclosure will become apparent upon reading the following detailed description and upon reference to the drawings.

[0033] FIG. 1 is an exploded view of a glenoid implant in a first configuration according to some implementations of the present disclosure;

[0034] FIG. 2 is a front isometric perspective view of the glenoid implant of FIG. 1 surgically interfaced to a scapula;

[0035] FIG. 3 is a side isometric perspective view of the glenoid implant of FIG. 1;

[0036] FIG. 4 is a front view of the glenoid implant of FIG. 1 with a first, second and third cross-section;

[0037] FIG. 5 is a side view of the glenoid implant of FIG. 4 at the first cross-section;

[0038] FIG. 6 is a side view of the glenoid implant of FIG. 4 at the second cross-section;

[0039] FIG. 7 is a side view of the glenoid implant of FIG. 4 at the third cross-section;

[0040] FIG. 8 is a front view of the glenoid implant of FIG. 1 surgically interfaced to a scapula, with a fourth, and fifth cross-section;

[0041] FIG. 9 is a side view of the glenoid implant of FIG. 8 at the first cross-section;

[0042] FIG. 10 is a side view of the glenoid implant of FIG. 8 at the second cross-section;

[0043] FIG. 11 is a front isometric exploded view of a glenoid implant in a second configuration according to some implementations of the present disclosure;

[0044] FIG. 12 is a side isometric perspective view of the glenoid implant of FIG. 11 surgically interfaced to a scapula;

[0045] FIG. 13 is a side isometric perspective view of the glenoid implant of FIG. 11;

[0046] FIG. 14 is a front view of the glenoid implant of FIG. 11 with a cross-section;

[0047] FIG. 15 is a side view of the glenoid implant of FIG. 14 at the cross-section;

[0048] FIG. 16 is a rear isometric exploded view of the glenoid implant of FIG. 11;

[0049] FIG. 17 is a front isometric exploded view of a glenoid implant in a third configuration according to some implementations of the present disclosure;

[0050] FIG. 18 is a rear isometric exploded view of the glenoid implant of FIG. 17;

[0051] FIG. 19 is a cross-sectional side view of the glenoid implant of FIG. 17 surgically interfaced to a scapula;

[0052] FIG. 20 is a rear isometric exploded view of a glenoid implant in a fourth configuration according to some implementations of the present disclosure;

[0053] FIG. 21 is a front isometric exploded view of the glenoid implant of FIG. 20;

[0054] FIG. 22 is a first side view of the glenoid implant of FIG. 20;

[0055] FIG. 23 is a second side view of the glenoid implant of FIG. 20;

[0056] FIG. 24 is a rear isometric exploded view of a glenoid implant in a fifth configuration according to some implementations of the present disclosure;

[0057] FIG. 25 is a front isometric exploded view of the glenoid implant of FIG. 24;

[0058] FIG. 26 is a side isometric view of the glenoid implant of FIG. 24;

[0059] FIG. 27 is a cross-sectional side view of the glenoid implant of FIG. 24;

[0060] FIG. 28 is a front isometric exploded view of a glenoid implant in a sixth configuration according to some implementations of the present disclosure;

[0061] FIG. 29 is a rear isometric exploded view of the glenoid implant of FIG. 28;

[0062] FIG. 30 is a front isometric view of the glenoid implant of FIG. 28;

[0063] FIG. 31 is a rear isometric view of the glenoid implant of FIG. 28;

[0064] FIG. 32 is a cross-sectional isometric view of the glenoid implant of FIG. 28;

[0065] FIG. 33 is a side view of the glenoid implant of FIG. 28 in a first implementation;

[0066] FIG. 34 is a side view of the glenoid implant of FIG. 28 in a second implementation;

[0067] FIG. 35 is a side view of the glenoid implant of FIG. 28 in a third implementation;

[0068] FIG. 36 is a rear isometric exploded view of a glenoid implant in a seventh configuration according to some implementations of the present disclosure;

[0069] FIG. 37 is a front isometric exploded view of the glenoid implant of FIG. 36;

[0070] FIG. 38 is a front isometric view of a glenoid implant in an eighth configuration according to some implementations of the present disclosure;

[0071] FIG. 39 is a rear isometric view of the glenoid implant of FIG. 38;

[0072] FIG. 40 is a cross-sectional isometric view of the glenoid implant of FIG. 38;

[0073] FIG. 41 is a front isometric view of a glenoid implant in a ninth configuration according to some implementations of the present disclosure;

[0074] FIG. 42 is a rear isometric view of the glenoid implant of FIG. 41;

[0075] FIG. 43 is a cross-sectional isometric view of the glenoid implant of FIG. 41;

[0076] FIG. 44 is a front isometric exploded view of a glenoid implant in a tenth configuration according to some implementations of the present disclosure;

[0077] FIG. 45 is a rear isometric exploded view of the glenoid implant of FIG. 44;

[0078] FIG. 46 is a right rear isometric view of the glenoid implant of FIG. 44;

[0079] FIG. 47 is a left rear isometric view of the glenoid implant of FIG. 44;

[0080] FIG. 48 is a cross-sectional side view of the glenoid implant of FIG. 44;

[0081] FIG. 49 is a front isometric view of a partial assembled glenoid implant of FIG. 44;

[0082] FIG. 50 is a front isometric view of a partial assembled glenoid implant of FIG. 44;

[0083] FIG. 51 is a rear isometric view of a glenosphere in a first configuration according to some implementations of the present disclosure;

[0084] FIG. 52 is a rear isometric view of a glenosphere in a second configuration according to some implementations of the present disclosure;

[0085] FIG. 53 is a rear isometric view of a glenosphere in a third configuration according to some implementations of the present disclosure;

[0086] FIG. 54 is a rear isometric exploded view of a glenoid implant in an eleventh configuration according to some implementations of the present disclosure;

[0087] FIG. 55 is a front isometric exploded view of the glenoid implant of FIG. 54;

[0088] FIG. 56 is a front isometric exploded view of a glenoid implant in a twelfth configuration according to some implementations of the present disclosure;

[0089] FIG. 57 is a right rear isometric view of the glenoid implant of FIG. 56;

[0090] FIG. 58 is a cross-sectional side view of the glenoid implant of FIG. 56;

[0091] FIG. 59 is a front isometric exploded view of a glenoid implant in a thirteenth configuration according to some implementations of the present disclosure;

[0092] FIG. 60 is a rear isometric view of the glenoid implant of FIG. 59;

[0093] FIG. 61 is a front isometric exploded view of a glenoid implant in a fourteenth configuration according to some implementations of the present disclosure;

[0094] FIG. 62 is a rear isometric view of the glenoid implant of FIG. 61;

[0095] FIG. 63 is a front isometric exploded view of a glenoid implant in a fifteenth configuration according to some implementations of the present disclosure;

[0096] FIG. 64 is a rear isometric view of the glenoid implant of FIG. 63;

[0097] FIG. 65 is a front isometric exploded view of a glenoid implant in a sixteenth configuration according to some implementations of the present disclosure;

[0098] FIG. 66 is a rear isometric view of the glenoid implant of FIG. 65;

[0099] FIG. 67 is a front isometric exploded view of a glenoid implant in a seventeenth configuration according to some implementations of the present disclosure;

[0100] FIG. 68 is a rear isometric view of the glenoid implant of FIG. 67;

[0101] FIG. 69 is a front isometric exploded view of a glenoid implant in an eighteenth configuration according to some implementations of the present disclosure;

[0102] FIG. 70 is a rear isometric view of the glenoid implant of FIG. 69;

[0103] FIG. 71 is a front isometric exploded view of a glenoid implant in a nineteenth configuration according to some implementations of the present disclosure;

[0104] FIG. 72 is a rear isometric view of the glenoid implant of FIG. 71;

[0105] FIG. 73 is a front isometric exploded view of a glenoid implant in a twentieth configuration according to some implementations of the present disclosure;

[0106] FIG. 74 is a rear isometric view of the glenoid implant of FIG. 73;

[0107] FIG. 75 is a front isometric exploded view of a glenoid implant in a twenty-first configuration according to some implementations of the present disclosure;

[0108] FIG. 76 is a rear isometric view of the glenoid implant of FIG. 75;

[0109] FIG. 77 is a front isometric view of a glenoid implant in a twenty-second configuration according to some implementations of the present disclosure;

[0110] FIG. 78 is a top view of the glenoid implant of FIG. 77 with a cross-section;

[0111] FIG. 79 is a side view of the glenoid implant of FIG. 78 at the cross-section;

[0112] FIG. 80 is a first side view of the glenoid implant of FIG. 77 with a cross-section;

[0113] FIG. 81 is the first side view of the glenoid implant of FIG. 80 at the cross-section;

[0114] FIG. 82 is a second side view of the glenoid implant of FIG. 77 with a cross-section;

[0115] FIG. 83 is the second side view of the glenoid implant of FIG. 82 at the cross-section;

[0116] FIG. 84 is a top isometric view of a glenoid implant in a twenty-third configuration according to some implementations of the present disclosure;

[0117] FIG. 85 is a side view of the glenoid implant of FIG. 84 with a cross-section;

[0118] FIG. 86 is the side view of the glenoid implant of FIG. 85 at the cross-section;

[0119] FIG. 87 is a top view of the glenoid implant of FIG. 84 with a cross-section;

[0120] FIG. 88 is the side view of the glenoid implant of FIG. 87 at the cross-section;

[0121] FIG. 89 is a top isometric view of a glenoid implant in a twenty-fourth configuration according to some implementations of the present disclosure;

[0122] FIG. 90 is a side view of the glenoid implant of FIG. 89 with a cross-section;

[0123] FIG. 91 is the side view of the glenoid implant of FIG. 90 at the cross-section;

[0124] FIG. 92 is a top view of the glenoid implant of FIG. 89 with a cross-section;

[0125] FIG. 93 is the side view of the glenoid implant of FIG. 92 at the cross-section;

[0126] FIG. 94 is a rear isometric exploded view of a glenoid implant in a twenty-fifth configuration according to some implementations of the present disclosure;

[0127] FIG. 95 is a front isometric view of the glenoid implant of FIG. 94;

[0128] FIG. 96 is a rear isometric exploded view of a glenoid implant in a twenty-sixth configuration according to some implementations of the present disclosure;

[0129] FIG. 97 is a front isometric view of the glenoid implant of FIG. 96;

[0130] FIG. 98 is an exploded view of a glenoid implant in a twenty-seventh configuration according to some implementations of the present disclosure;

[0131] FIG. 99 is a front isometric perspective view of the glenoid implant of FIG. 98 surgically interfaced to a scapula;

[0132] FIG. 100 is an exploded view of a glenoid implant in a twenty-eight configuration according to some implementations of the present disclosure; and

[0133] FIG. 101 is a front isometric perspective view of the glenoid implant of FIG. 100 surgically interfaced to a scapula.

[0134] While the present disclosure is susceptible to various modifications and alternative forms, specific implementations and embodiments have been shown by way of example in the drawings and will be described in detail herein. It should be understood, however, that the present disclosure is not intended to be limited to the particular forms disclosed. Rather, the present disclosure is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the present disclosure as defined by the appended claims.

DETAILED DESCRIPTION

[0135] Referring generally to FIGS. 1-10, a glenoid implant 100 is illustrated. FIG. 1 is an exploded view of a glenoid implant 100. FIG. 3 is a side isometric perspective view of the glenoid implant 100. The glenoid implant 100 can be implemented in cases of severe bone loss. The glenoid implant 100 includes a baseplate 140, a first leg 110, a second leg 120 and a third leg 130. In some implementations, the first leg 110 can extend from the baseplate 140 in a first direction, the second leg 120 can extend from the baseplate 140 in a second direction, and the third leg 130 can extend from the baseplate 140 in a third direction. The legs can be curved with respect to the baseplate 140. In alternative implementations, the legs can extend radially outward from the baseplate 140 without curvature.

[0136] The baseplate 140 can include a central aperture 141 therethrough. The first leg 110 can also include an aperture 111. The aperture 111 can be configured to receive a portion of a first fastening element 115 therethrough. The second leg 120 can also include an aperture 121. The aperture 121 can be configured to receive a portion of a second fastening element 125 therethrough. Similarly, the third leg 130 can include an aperture 131. The aperture 131 can be configured to receive a portion of a third fastening element 135 therethrough. While the

first 110, second 120, and third 130 legs are described with one aperture, it should be understood that each leg can contain more than one apertures. In some implementations, the second leg 120 is longer than the first leg 110 and the third leg 130.

[0137] The glenoid implant 100 can also include a central fastening element 150 configured to be at least partially positioned through the central aperture 141 of the baseplate 140. The central fastening element 150 can be configured as a compression screw, or as a lock screw. The fastening element 150 can include a screw component 152, a head element 153, and a receiving element 151. The receiving element 151 can receive a tool implemented to turn the central fastening element 150. In some implementations, the head 153 of the central fastening element 150 is configured to be coupled with one or more additional components using a Morse taper press fit. In alternative implementations, the head 153 of the central fastening element 150 is configured to be coupled with a humeral head.

[0138] As best shown in FIG. 2, the glenoid implant 100 can be surgically interfaced to a scapula 50 of a patient. For the purposes of this disclosure, the scapula 50 is illustrated with four portions. The first portion 51 of the scapula includes the Infraglenoid tubercle (also referred to as the lateral boarder of the scapula) and/or the For Subscapularis, the second portion 53 includes the Acromion, the third portion 52 includes the Coracoid, and the fourth portion 54 includes the glenoid cavity. The first fastening element 115 can aid in securing the first leg 110 to the Infraglenoid tubercle and/or the For Subscapularis. The second fastening element 125 can aid in securing the second leg 120 to the Acromion. The third fastening element 135 can aid in securing the third leg 130 to the Coracoid. The central fastening element 150 can aid in securing the baseplate 140 to the glenoid cavity. For example, the central fastening element 150 can compress the baseplate 140 to the glenoid cavity. In alternative implementations, the central fastening element 150 can simply attach to the baseplate 140, not pulling the baseplate 140 into the glenoid cavity.

[0139] In some implementations, the first fastening element 115, the second fastening element 125, and the third fastening element 135 are configured to provide the glenoid implant 100 with bi-cortical support. In this way, the first fastening element 115, the second fastening element 125, and the third fastening element 135 are configured to protrude from the scapula 50 opposite the glenoid implant 100, to potentially connect two cortical plates. This is illustrated in FIGS. 8, 9 and 10. In alternative implementations, the first fastening element 115, the second fastening element 125, and the third fastening element 135 are configured to provide the glenoid implant 100 with uni-cortical support. In some implementations, the first fastening element 115, the second fastening element 125, and the third fastening element 135 can be self-tapping.

[0140] The first leg 110, the second leg 120, and the third leg 130 are curved to account for curvature of the Infraglenoid tubercle, the Acromion, and the Coracoid. In this way, a radius of curvature of the first leg 110, the second leg 120, and the third leg 130 aid in a substantial portion of the glenoid implant 100 directly abutting the Infraglenoid tubercle, the Acromion, and the Coracoid, respectively. In some implementations, at least seventy-five percent of a rear surface of the glenoid implant 100 directly abuts the scapula 50 prior to bone grafting material being applied.

[0141] FIG. 4 is a front view of the glenoid implant 100 with a first cross-section 5-5, second cross-section 6-6, and third cross-section 7-7. FIG. 5 is a side view of the glenoid implant 100 at the first cross-section 5-5. FIG. 6 is a side view of the glenoid implant 100 at the second cross-section 6-6. FIG. 7 is a side view of the glenoid implant 100 at the third cross-section 7-7. As best shown in FIG. 5, the first leg 110 can extend from the baseplate 140 generally along a first arc $\Theta 1$. As shown in FIG. 7, the second leg 120 can extend from the baseplate 140 generally along a second arc $\Theta 2$. As shown in FIG. 6, the third leg 130 can extend from the baseplate 140 generally along a third arc $\Theta 3$.

[0142] The radii of curvatures for each of the legs can vary with respect to one another. For example, the radius of curvature for the first arc Θ1 can be larger than the radius of curvature for the second arc Θ2. In some alternative implementations, the radius of curvature for the second arc Θ2 is larger than the radius of curvature for the first arc Θ1. Moreover, the radius of curvature for the first arc Θ1 can be the same as a radius of curvature for the second arc Θ2. This is the same with respect to the radius of curvature for the third arc Θ3. In some implementations, the radius of curvature for the third arc Θ3 is smaller than the radius of curvature for the second arc Θ2 and the radius of curvature for the first arc Θ1. In alternative embodiments, the radius of curvature for the third arc Θ3 is the same as the radius of curvature for the second arc Θ2 and the radius of curvature for the first arc Θ1.

[0143] As illustrated herein, the baseplate 140, the first leg 110, the second leg 120, and the third leg 130 form a single monolithic part. However, in some implementations, the baseplate 140 can include a first portion coupled to a second portion such that the central aperture is defined by both the first portion and the second portion. In this case, the first portion of the baseplate, the first leg 110, and the second leg 120 form a first monolithic part and the second portion of the baseplate and the third leg 130 form a second monolithic part that is separate and distinct from the first monolithic part. This is discussed in greater detail with respect to FIG. 11.

[0144] Now referring to FIGS. 11-16, a glenoid implant 200 is illustrated. FIG. 11 is a front isometric exploded view of the glenoid implant 200. FIG. 13 is a side isometric perspective view of the glenoid implant 200. FIG. 14 is a front view of the glenoid implant 200 with a cross-section 15-15. FIG. 15 is a side view of the glenoid implant 200 at the cross-section 15-15. FIG. 16 is a rear isometric exploded view of the glenoid implant 200. The glenoid implant 200 includes a base with a first portion 230 and a second portion 260. The first portion 230 can include a first aperture 240 therethrough. Likewise, the second portion

260 can include a second aperture 265 therethrough. The first aperture 240 can be configured to align with the second aperture 265, thereby defining a central aperture of the base, responsive to the first portion 230 being coupled to the second portion 260.

[0145] The first leg 210 can extend from the first portion 230 of the base generally along a first arc. Likewise, the second leg 220 can extend from the first portion 230 of the base generally along a second arc. The first leg 210 can include a first aperture 211. The second leg 220 can include a second aperture 221. The first aperture 211 can be configured to receive a portion of a first fastening element 215 therethrough. Similarly, the second aperture 221 can be configured to receive a portion of a second fastening element 225 therethrough. The glenoid implant 200 can also include a central fastening element 250 configured to be at least partially positioned through the first aperture 240 and the aligned second aperture 265.

[0146] The adjustable third leg 270 can extend from the second portion 260 of the base generally along a third arc in response to the first portion 230 being coupled to the second portion 260. The adjustable third leg 270 can include a third aperture 271 therein configured to receive a portion of a third fastening element 275 therethrough.

[0147] As best shown in FIG. 12, the glenoid implant 200 can be surgically interfaced to the scapula 50. The first fastening element 215 (not shown) can aid in securing the first leg 210 to the Coracoid. The second fastening element 225 (not shown) can aid in securing the second leg 220 to the Acromion. The third fastening element 275 can aid in securing the adjustable third leg 270 to the Infraglenoid tubercle. The central fastening element 250 can aid in securing the base to the glenoid cavity. Similar to the glenoid implant 100, the first fastening element 215 and the second fastening element 225 are configured to protrude from the scapula 50 opposite the glenoid implant 200, to potentially connect two cortical plates. In alternative implementations, the first fastening element 215 and the second fastening element 225 are configured to provide the glenoid implant 100 with uni-cortical support.

[0148] The separation of the base into two components allows for the rotation of the second portion 260 about the first portion 230. In this way, the glenoid implant 200 can be adjusted for varying anatomies of the scapula 50. Specifically, an angle between the adjustable third leg 270 and the first leg 210 can be adjusted to account for a distance between the first portion of the scapula 52 and the third portion of the scapula 51. This is also the case with the angle between the adjustable third leg 270 and the second leg 220.

[0149] Referring generally to FIGS. 17-19, a glenoid implant 300 is illustrated. As shown in FIG. 17, a glenoid implant 300 can include a base with a first portion 330 and a second portion 360, which are similar to the first portion 230 and the second portion 260 of the base described above in connection with the glenoid implant 200. The first portion 330 can include a first trunnion 337 extending outward. The glenoid implant 300 can further include a glenosphere 350 with a central aperture 351 and a first receiving space 352 (shown in FIG. 18). The central aperture 351 of the glenosphere 350 can be coupled to the first trunnion 337 of the first portion 330. The first trunnion 337 can include the central aperture 340 therethrough. The glenosphere 350 can be configured to be secured to the glenoid implant 300 via a central fastening element 355 through the central aperture 351, the central aperture 340, and the central aperture 365.

[0150] FIG. 18 is a rear isometric exploded view of the glenoid implant 300. The rear of the first portion 330 can include a second trunnion 336 extending outward. The first trunnion 337 and the second trunnion 336 can include the central aperture 340 therethrough. The second trunnion 336 can include splines configured to rotationally couple with corresponding grooves in the second aperture 365 of the second portion 360. In alternative implementations, the second trunnion 336 can include grooves configured to rotationally couple with corresponding splines in the second aperture 365 of the second portion 360. The first receiving space 352 of

the glenosphere 350 can be configured to receive an augment. This is described in further detail below.

[0151] As shown in FIG. 19, the glenoid implant 300 can be surgically interfaced to a scapula 50 of a patient. The first fastening element 315 (not shown), the second fastening element 325, the third fastening element 375, and the central fastening element 355 can aid in securing the glenoid implant 300 into the glenoid cavity. The central fastening element 355 can compress the glenoid implant 300 to the glenoid cavity. In alternative implementations, the central fastening element 355 can attach to the glenoid implant 300 , not pulling the glenoid implant 300 into the glenoid cavity.

[0152] Referring generally to FIGS. 20-23, a glenoid implant 400 is illustrated. FIGS. 20 and 21 are front and rear isometric exploded views of the glenoid implant 400. FIGS. 22 and 23 are first side and second side views of the assembled glenoid implant 400. The glenoid implant 400 can include a first portion 430 and the second portion 360, which are the same as, or similar to, the first portion 330 and the second portion 360 of the base described above in connection with the glenoid implant 300. Specific to the glenoid implant 400, the second leg 420 of the glenoid implant 400 can have a different geometry than the first leg 410. Specifically, the second leg 420 can be thicker than the first leg 410. In some implementations, the varying thickness of the legs can be fixed. In other implementations, the thickness of the legs can be adjusted during the surgical procedure. This is illustrated in the glenoid implant 500 of FIG. 24.

[0153] Referring generally to FIGS. 24-27, a glenoid implant 500 is illustrated. FIGS. 24 and 25 are front and rear isometric exploded views of the glenoid implant 500. FIG. 26 is a rear side isometric view of the glenoid implant 500. FIG. 27 is a cross-sectional side view of the glenoid implant 500. The glenoid implant 500 can include a first portion 530 and the second

portion 360, which are the same as, or similar to, the first portion 430 and the second portion 360 of the base described above in connection with the glenoid implant 400.

[0154] Specific to the glenoid implant 500, the second leg 520 can be configured to be coupled to an augment 590, to increase the thickness of the second leg 520. Specifically, the augment 590 can include a slot 592 configured to receive a projection 523 extending from the second leg 520, such that the augment 590 slides onto and is coupled to the second leg 520. The augment 590 can include at least one aperture 591. The aperture 591 can be aligned with the aperture 521 of the second leg 521. In this way, the second fastening element 525 can be received through the second aperture 521 of the second leg 520 and the augment aperture 591 to aid in coupling the second leg 520 and the augment 590 to the glenoid cavity (similar to the glenoid cavity 300 of FIG. 19). While the glenoid implant 500 illustrates the augment 590 coupled to the second leg 520, it should be understood that the augment 590 can be coupled to either the first 510, second 520 or adjustable third leg 370.

[0155] The glenoid implant 500 can also include an offset element 570. The offset element 570 can include a base with a first trunnion 572 protruding from a first surface, and a second trunnion 571 protruding from a second surface opposite the first surface. The first trunnion 572 and the second trunnion 571 can have two distinct central axes. The first trunnion 572 can be aligned with the central aperture 540 of the first portion 530 and the central aperture 365 of the second portion 360. The second trunnion 571 can be aligned with the glenosphere central aperture 551. In this way, the glenosphere is coupled to the base such that a central axis of the central aperture 540 of the base is not aligned with a central axis of the aperture 551 within the glenosphere 550.

[0156] Referring generally to FIGS. 28-35, a glenoid implant 600 is illustrated. FIGS. 28 and 29 are front and rear isometric exploded views of the glenoid implant 600. FIGS. 30 and 31 are front and rear isometric views of the glenoid implant 600. FIG. 32 is a cross-sectional

isometric view of the glenoid implant 600. The glenoid implant 600 can include a first portion 630 and the second portion 360, which are the same as, or similar to, the first portion 530 and the second portion 360 of the base described above in connection with the glenoid implant 500.

[0157] Specific to the glenoid implant 600, the first and second legs 610, 620 can be configured with additional apertures. As illustrated herein, the first leg 610 can include four apertures 611. Each aperture 611 can be configured to receive a portion of a first fastening element 615 therethrough. The second leg 620 can also include four apertures 621. Each aperture 621 can be configured to receive a portion of a second fastening element 625 therethrough. The additional apertures in the first and second legs 610, 620 assist with the lateralization of the glenoid implant 600.

[0158] While the second component 360 has been illustrated with multiple implementations discussed above, it should be understood that the geometry of the second component 360 can also vary. FIGS. 33, 34 and 35 are side views of the glenoid implant 600 in a first, second, and third implementation, respectively. As best shown in FIG. 33, the second component 360 can include a first thickness $\Delta 1$. The first and second legs 610, 620 can also have a first thickness to account for the first thickness $\Delta 1$ of the second component 360. FIG. 34 illustrates the second component 360 with a second thickness $\Delta 2$. The second thickness $\Delta 2$ can include a 5 mm offset from the first thickness $\Delta 1$. The first and second legs 610, 620 can have a second thickness to account for the second thickness $\Delta 2$ of the second component 360. FIG. 35 illustrates the second component 360 with a third thickness $\Delta 3$. The third thickness $\Delta 3$ can include a 10 mm offset from the first thickness $\Delta 1$. The first and second legs 610, 620 can also have a third thickness to account for the third thickness $\Delta 3$ of the second component 360. In this way, once the first component 630 and the second component 360 is assembled, the rear of the glenoid implant 600 can have a continuous surface.

[0159] Referring generally to FIGS. 36-37, a glenoid implant 700 is illustrated. FIGS. 36 and 37 are front and rear isometric exploded views of the glenoid implant 700. The glenoid implant 700 can include a first portion 730 and the second portion 360, which are the same as, or similar to, the first portion 630 and the second portion 360 of the base described above in connection with the glenoid implant 600.

[0160] Specific to the glenoid implant 700, a scapula contacting surface 712 of the first leg 710 can have a different geometry than the scapula contacting surface 722 of the second leg 720. The scapula contacting surface 712 of the first leg 710 can include a convex surface while the scapula contacting surface 722 of the second leg 720, and the adjustable third leg 370 includes a concave surface. Moreover, the thickness of each leg can vary, as discussed above. While the scapula contacting surface 712 of the first leg 710 is illustrated with the convex surface, it should be understood that the contacting surface 722 of the second leg 720 or the adjustable third leg 360 can also have a convex surface.

[0161] Referring momentarily to FIGS. 98-99, a glenoid implant 2500 is illustrated. FIGS. 98 is an exploded view of the glenoid implant 2500. FIG. 99 is a side isometric perspective view of the glenoid implant 2500. The glenoid implant 2500 can include a first portion 2530 and the second portion 360, which are the same as, or similar to, the first portion 730 and the second portion 360 of the base described above in connection with the glenoid implant 700.

[0162] Specific to the glenoid implant 2500, the first leg 2510 and the second leg 2520 can have a flat face surface and rounded rear surface configured to contact the scapula. In this configuration, each leg of the glenoid implant can be designed based on the profile of the scapula.

[0163] Referring momentarily to FIGS. 100-101, a glenoid implant 2600 is illustrated. FIGS. 100 is an exploded view of the glenoid implant 2600. FIG. 101 is a side isometric perspective view of the glenoid implant 2600. The glenoid implant 2600 can include a first

portion 2630 and the second portion 360, which are the same as, or similar to, the first portion 2530 and the second portion 360 of the base described above in connection with the glenoid implant 2500.

[0164] Specific to the glenoid implant 2500, the first leg 2510 and the second leg 2520 can each have a unique arc. In this configuration, each leg of the glenoid implant can be designed based on the profile of the scapula. Specifically, the first leg 2510 and the second leg 2520 are bent in place depending on the anatomy of the scapula.

[0165] Referring generally to FIGS. 38-40, a second portion 460 is illustrated. FIGS. 38 and 39 are front and rear isometric views of the second portion 460. FIG. 40 is a cross-sectional isometric view of the second portion 460. The second portion 460 can include an adjustable leg 470 with an aperture 471 and a body 466. The adjustable leg 470 can be configured to extend from the body 466. The body 466 can include a central aperture 465. The second portion 460 can also include a keel component 476 extending from a rear surface of the second portion 460. The keel component 476 can be configured to be inserted into a cavity defect of the glenoid cavity of a scapula. This is discussed in greater detail below.

[0166] Referring generally to FIGS. 41-43, a second portion 560 is illustrated. FIGS. 41 and 42 are front and rear isometric views of the second portion 560. FIG. 43 is a cross-sectional isometric view of the second portion 560. The second portion 560 can include an adjustable leg 570 and a body 566, which are similar to, the adjustable leg 470 and the body 466 of the second portion 460 described above.

[0167] Specific to the second portion 560, the adjustable leg 570 can have a wider geometry than the adjustable leg 470 of the second portion 460. In addition, the body 566 can have a greater thickness than the body 466 of the second portion 460. It should be understood the second portion can vary in size and geometry based on the amount of bone loss of the patient. As best shown in FIGS. 40 and 43, the second portion 560 can be angled more for more severe

bone loss. For example, the body 466 and the adjustable third leg 470 can be spaced between 130-135 degrees. Whereas, the body 566 and the adjustable third leg 570 can be spaced about 45 degrees. A glenosphere can be coupled to the body 466 or 566. This is discussed in greater detail below.

[0168] Referring generally to FIGS. 44-50, a glenoid implant 800 is illustrated. FIGS. 44 and 45 are front and rear isometric exploded views of the glenoid implant 800. FIGS. 46 and 47 are right and left rear isometric views of the glenoid implant 800. FIG. 48 is a cross-sectional side view of the glenoid implant 800. FIGS. 49 and 50 are front isometric views of a partial assembled glenoid implant 800.

[0169] The glenoid implant 800 can include a first portion 830 and the second portion 560, which are similar to the first portion 730 and the second portion 360 of the base described above in connection with the glenoid implant 700. Specific to the glenoid implant 800, the first and second legs 810, 820 can include a different geometry. The first leg 810 can have a single aperture 811, and the second leg 820 can have a single aperture 812. Furthermore, the first and second legs 810, 820 do not extend far from the first trunnion 837. In fact, the first portion 830 is smaller in size with respect to previous implementations discussed herein. The first trunnion 837 can include a central aperture 840 configured to align with the central aperture 565 of the second portion 560.

[0170] As best shown in FIG. 45, the first leg 810 can have a receiving space 812 configured to receive an augment 805. Similarly, the second leg 820 can have a receiving space 822 configured to receive an augment. The rear of the first portion 830 can also include a second trunnion 836 configured to be received within the central aperture 565 of the second portion 560. The augments 805 can be provided to provide additional support to the glenoid implant 800 by increasing the relative thickness of the leg. Each augment 805 can include a corresponding aperture 806 that aligns with, for example, the first aperture 811 in the first leg

810. The alignment of the apertures allows the first fastening element 815 to be received through the first aperture 811 of the first leg 810 and the aperture 806 of the augment 805.

[0171] The glenoid implant 800 can also include a central fastening element 855 configured to be at least partially positioned through the central aperture 840 of the first portion 830 and the central aperture 565 of the second portion 560. The glenoid implant 800 can also include a glenosphere 850 configured to be secured to the first and second portions 830, 560 via the central fastening element 855. As best shown in FIGS. 46 and 47, the glenosphere 850 can include receiving spaces 852 configured to receive an augment 804. The augments 804 in the bottom of the glenosphere 850 can be attached with a screw. Alternatively, the augments 804 can be tapered and hammered into the glenosphere 850.

[0172] As best shown in FIG. 49, the head 856 of the central fastening element 855 can be tapered. The tapered head 856 can be configured to couple with a tapered element 857. The tapered element 857 is configured to be received within the central aperture 840 of the first portion 830, which is also tapered. The central fastening element 855 and the tapered element 857 are configured to screw into place in alternative directions. In an alternative implementation shown in FIG. 50, the head 856 of the central fastening element 855 can be non-tapered. The non-tapered head 856 can be configured to couple with a tapered element 857. In this implementation, the central fastening element 855 is installed normally and then the tapered element 857 is fitted over the central fastening element 855. This implementation minimizes micro motion between the central fastening element 855 and the tapered element 857, to prevent the central fastening element 855 from backing out.

[0173] The tapered element 857 is configured to be received within the central aperture 840 of the first portion 830, which is also tapered. The tapered element 857 is configured to lock the central fastening element 855 in place. As best shown in FIG. 48, the central aperture

851 of the glenosphere 850 can be configured to receive the first trunnion 837. In this way, the glenosphere 850 is secured to the base of the glenoid implant 800.

[0174] While the glenosphere 850 has been illustrated as discussed above, it should be understood that the geometry of the glenosphere 850 can also vary. FIGS. 51, 52 and 53 are rear isometric views of a glenosphere 850 in a first, second and third configuration, respectively. FIG. 51 illustrates the glenosphere 850 with a central aperture 851 and receiving slots 852 for an augment (not shown). FIG. 52 illustrates the glenosphere 850 with a central aperture 851, receiving slots 852, and a tab feature 853. Due to the tab feature 853 location on the glenosphere 850, the position and size of the receiving slots 852 of the second configuration varies with respect to that of the receiving slots of the first configuration. FIG. 53 illustrates the glenosphere 850 with a central aperture 851, a first tab feature 853, and a second tab feature 854 opposite the first tab feature 853. These tab features can assist in securing the glenoid implant to the glenosphere. They can also provide additional support to the scapula.

[0175] Referring generally to FIGS. 54-55, a glenoid implant 900 is illustrated. FIGS. 54 and 55 are rear isometric exploded views of the glenoid implant 900. The glenoid implant 900 can include a base element 960, a coupling element 930, and an augment 940. The base element 960 can include a central aperture 961 and an adjustable third leg 970, which includes a second aperture 971. The base element 960 can also include a keel element 965 extending from a rear of the base element 960. The keel element 965 is configured to secure the base element 960 to a first portion of a scapula. The second aperture 971 can be configured to receive a portion of a first fastening element 975 therethrough to aid in securing the base element 960 to the first portion of the scapula. In this implementation, the first portion of the scapula is a glenoid cavity. The coupling element 930 can having a first elongated portion 910 and a second portion 935. The first elongated portion 910 can include a receiving space 920, and apertures 911

therethrough. Furthermore, the second portion 935 can include a central aperture 938 aligned with the central aperture 961 of the base element 960.

[0176] The augment 940 can be configured to be received within the receiving space 920 of the first elongated portion 910 of the coupling element 930. The augment can include apertures 941 therethrough. Each aperture 911 of the coupling element 930 can be aligned with each aperture 941 of the augment 940 to receive a portion of a second fastening element 915 therethrough. The second fastening element 915 can aid in securing the coupling element 930 and the augment 940 to a second portion of the scapula.

[0177] The second portion 935 of the coupling element 930 can include a first trunnion 937 and a second trunnion 936 opposite the first trunnion 937. The first trunnion 937 is configured to receive a glenosphere (not shown). The second trunnion 936 can be configured to be received within the central aperture 961 of the base element 960. As a result, the coupling element 960 and the augment 940, once coupled, are configured to rotate about the base element 960. While three second fastening elements 915 are illustrated herein, it should be understood that not all the second fastening elements 915 need be included if the coupling element 960 and the augment 940 are rotated to one side. The glenoid implant 900 can be implemented in cases of severe bone loss. The base element 960 can be configured as an inlay component, meaning, the keel element 965 is shaped to account for a cavity defect.

[0178] The glenoid implant 900 can also include a central fastening element 955 configured to be at least partially positioned through the central aperture 961 of the base element 960 and the central aperture 938 of the coupling element 930. The central fastening element 955 is similar in variations with the central fastening element 855 of the glenoid implant 800.

[0179] Referring generally to FIGS. 56-58, a glenoid implant 1000 is illustrated. FIG. 56 is a front isometric exploded view of the glenoid implant 1000. FIG. 57 is a right rear isometric

view of the glenoid implant 1000. FIG. 58 is a cross-sectional side view of the glenoid implant 1000.

[0180] The glenoid implant 1000 can include a base element 1060, a coupling element 1030, and an augment 1040, which are similar to, the base element 960, a coupling element 930, and an augment 940 of the glenoid implant 900. Specific to the glenoid implant 1000, the coupling element 1030 can have a shallower receiving area (not shown) than that of the coupling element 930. Furthermore, the base element 1060 can include a tab feature 1072 extending from the aperture 1071 of the adjustable third leg 1070. Moreover, the coupling element 1030 can have a sole trunnion 1036 extending from the rear, and configured to be received within the central aperture 1061 of the base element 1060. The glenosphere 1050 can be connected to the coupling element 1030 with a trunnion 1052 extending from the glenosphere 1050. The trunnion 1052 can be configured to be received within the central aperture 1038 of the coupling element 1030.

[0181] Referring generally to FIGS. 59-60, a glenoid implant 1100 is illustrated. FIGS. 59 and 60 are front and rear isometric exploded views of the glenoid implant 1100. The glenoid implant 1100 can include a base element 1160, and a coupling element 1130, which are similar to, the base element 1060, and the coupling element 1030 of the glenoid implant 1000. Specific to the glenoid implant 1100, the coupling element 1130 does not have a receiving area because there is no augment component to attach. The first elongated portion 1110 has an extended geometrical shape, and is not flat like its predecessors discussed above. Furthermore, the second trunnion 1136 is shorter than the trunnion 1036 discussed above. This is because the base component 1160 has a slimmer profile than the base component 1060 discussed above.

[0182] The base element 1160 has a flat rear surface, as it is configured as an onlay component. The glenosphere 1150 can include receiving elements 1153 and 1154. The receiving elements 1153 can be configured to receive augments 1104. The augments 1104 in

the bottom of the glenosphere 1150 can be attached with a screw. Alternatively, the augments 1104 can be tapered and hammered into the glenosphere 1150.

[0183] Referring generally to FIGS. 61-62, a glenoid implant 1200 is illustrated. FIGS. 61 and 62 are front and rear isometric exploded views of the glenoid implant 1200. The glenoid implant 1200 can include a base element 1260, a coupling element 1230, and an augment 1210, which are similar to, the base element 1060, a coupling element 1030, and an augment 1040 of the glenoid implant 1000. Specific to the glenoid implant 1200, the glenosphere 1250 no longer includes trunnion. Instead, the glenoid implant 1200 includes a double trunnion element 1220, which include a first end 1221 and a second end 1222. A central fastening element 1255 can be received at the first end 1221 of the double trunnion element 1220 and a threaded element 1257 can be received at the second end 1222 of the double trunnion element 1220. The threaded element 1257 locks the double trunnion element 1220 to the coupling element 1230 and prevents the central fastening element 1255 from backing out. The threaded element 1257 screws onto the head 1256 of the central fastening element 1255.

[0184] Referring generally to FIGS. 63-64, a glenoid implant 1300 is illustrated. FIGS. 63 and 64 are front and rear isometric exploded views of the glenoid implant 1300. The glenoid implant 1300 can include a base element 1360 and a glenosphere 1350, which are similar to, the base element 1160 and the glenosphere 1150 of the glenoid implant 1100. Furthermore, the glenoid implant 1300 can include a coupling element 1330 and an augment 1320, which are similar to, the coupling element 1230 and the augment 1210 of the glenoid implant 1200.

[0185] Specific to the glenoid implant 1300, the base element 1360 includes a rear trunnion 1362 configured to abut a removable wedge 1380. The base element 1360 can also include a receiving element 1363 adjacent to the rear trunnion 1362. The removable wedge 1380 can include an abutting element 1382 configured to abut the rear trunnion 1362, and a wedge 1390. The removable wedge 1380 can also include a central aperture 1381 configured to receive a

fastening element 1395. The fastening element 1395 can be partially received by the central aperture 1381 and the receiving element 1363. In this way, the removable wedge 1380 can be coupled to the base element 1360, providing the base element 1360 with a unique geometric shape configured to be inserted into a cavity defect of a scapula.

[0186] Referring generally to FIGS. 65-66, a glenoid implant 1400 is illustrated. FIGS. 65 and 66 are front and rear isometric exploded views of the glenoid implant 1400. The glenoid implant 1400 can include a base element 1460, a removable wedge 1480, a fastening element 1495, and a glenosphere 1450, which are similar to, the base element 1360, the removable wedge 1380, the fastening element 1395, and the glenosphere 1350 of the glenoid implant 1300. However, the glenoid implant 1400 does not include a coupling element or an augment, as the glenosphere 1450 is directly coupled with the base element 1460.

[0187] Referring generally to FIGS. 67-68, a glenoid implant 1500 is illustrated. FIGS. 67 and 68 are front and rear isometric exploded views of the glenoid implant 1500. The glenoid implant 1500 can include a base element 1560, a glenosphere 1550, a coupling element 1530, an augment 1520, and a wedge element 1580, which are similar to the base element 1360, the glenosphere 1350, the coupling element 1330, the augment 1320, and the wedge element 1380 of the glenoid implant 1300. The glenosphere 1550 does not include a trunnion because the glenosphere 1550 is connected to the coupling element 1530 using an offset element 1566. The offset element 1566 can include a base with a first trunnion 1567 protruding from a first surface, and a second trunnion 1568 protruding from a second surface opposite the first surface. The first trunnion 1567 and the second trunnion 1568 can have two distinct central axes. The first trunnion 1567 can be aligned with the central aperture 1540 of the coupling element 1530 and the central aperture 1561 of the base element 1560. The second trunnion 1568 can be aligned with a central aperture 1551 of the glenosphere 1550. In this way, the glenosphere 1550 is coupled to the coupling element 1530 such that a central axis x_1 of the central aperture 1540 of

the coupling element 1530 is not aligned with a central axis x_2 of the aperture 1551 within the glenosphere 1550.

[0188] Referring generally to FIGS. 69-70, a glenoid implant 1600 is illustrated. FIGS. 69 and 70 are front and rear isometric exploded views of the glenoid implant 1600. The glenoid implant 1600 can include a base element 1660, a glenosphere 1650, and a double trunnion 1620, which are similar to the base element 1260, the glenosphere 1250, and a double trunnion 1220 of the glenoid implant 1200. The glenoid implant 1600 also includes a coupling element 1630 that is biased to one side of the base element 1660. The coupling element includes a first elongated portion 1610 and a central aperture 1631. The elongated portion 1610 includes apertures 1611 therethrough, each configured to receive a portion of a second fastening element 1615. The coupling element 1630 also includes a trunnion 1636 configured to be inserted into the central aperture 1661 of the base element 1660.

[0189] Referring generally to FIGS. 71-72, a glenoid implant 1700 is illustrated. FIGS. 71 and 72 are front and rear isometric exploded views of the glenoid implant 1700. The glenoid implant 1700 includes a coupling element 1730 and an augment 1720, both biased to one side of the base element 1760. The coupling element 1730 includes a first elongated portion 1710 and a central aperture 1735. The elongated portion 1710 includes a receiving space 1712 configured to receive the augment 1720. The elongated portion 1710 has a slimmer profile than the elongated portion 1610 of the glenoid implant 1600.

[0190] Referring generally to FIGS. 73-74, a glenoid implant 1800 is illustrated. FIGS. 73 and 74 are front and rear isometric exploded views of the glenoid implant 1800. The glenoid implant 1800 includes a coupling element 1830, an augment 1820, an offset device 1866, and a glenosphere 1850, which are similar to the coupling element 1530, the augment 1520, the offset device 1566, and the glenosphere 1550 of the glenoid implant 1500. The base device

1860 can have a unibody wedge component. As best shown in FIG. 74, a left rear side of the base device 1860 is longer than the right, to create a unique profile for a specific cavity defect.

[0191] Referring generally to FIGS. 75-76, a glenoid implant 1900 is illustrated. FIGS. 75 and 76 are front and rear isometric exploded views of the glenoid implant 1900. The glenoid implant 1900 includes a coupling element 1930, an augment 1920, and a base device 1960, which are similar to the coupling element 1830, the augment 1820, and the base device 1860 of the glenoid implant 1800. The base device 1960 can have a wedge component that is thicker at the central aperture 1961 than the aperture 1971, to create a unique profile for a specific cavity defect.

[0192] Referring generally to FIGS. 77-83, a glenoid implant 2000 is illustrated. FIG. 77 is a front isometric view of the glenoid implant 2000. FIG. 78 is a top view of the glenoid implant 2000 with cross-section 79-79. FIG. 79 is a side view of the glenoid implant 2000 at the cross-section 79-79. FIG. 80 is a first top view of the glenoid implant 2000 with a cross-section 81-81. FIG. 81 is a first side view of the glenoid implant 2000 at the cross-section 81-81. FIG. 82 is a second top view of the glenoid implant 2000 with a cross-section 83-83. FIG. 83 is the second side view of the glenoid implant 2000 at the cross-section 83-83.

[0193] The glenoid implant 2000 can include a baseplate 2010 and a keel element 2020. The glenoid implant 2000 can include a central aperture 2040 therethrough. The glenoid implant 2000 can also include apertures 2011 therethrough. Each of the apertures 2011 can be positioned around the central aperture 2040. The keel element 2020 can extend from a rear of the baseplate 2010. The central aperture 2040 can extend through the keel element 2020 such that the keel element 2020 and the baseplate 2010 are aligned. The keel element 2020 can also include grooves 2021. Each aperture 2011 of the baseplate 2010 can be aligned with each groove 2021 of the keel element 2020 to receive a portion of a second fastening element 2015

therethrough. The keel element 2020 is shaped to account for a cavity defect within the scapula of a patient.

[0194] Referring generally to FIGS. 84-88, a glenoid implant 2100 is illustrated. FIG. 84 is a top isometric view of the glenoid implant 2100. FIG. 85 is a side view of the glenoid implant 2100 with a cross-section 86-86. FIG. 86 is the side view of the glenoid implant 2100 at the cross-section 86-86. FIG. 87 is a top view of the glenoid implant 2100 with a cross-section 88-88. FIG. 88 is the side view of the glenoid implant 2100 at the cross-section 88-88. The glenoid implant 2100 includes a baseplate 2110 and a keel device, which are similar to the baseplate 2010 and the keel device 2020 of the glenoid implant 2000. The keel device can be configured as a stepped component, with a first center component 2130 and a second side component 2120. In this way, at least one second fastening element 2115 will not pass through the keel component.

[0195] Referring generally to FIGS. 89-93, a glenoid implant 2200 is illustrated. FIG. 89 is a top isometric view of a glenoid implant 2200. FIG. 90 is a side view of the glenoid implant 2200 with a cross-section 91-91. FIG. 91 is the side view of the glenoid implant 2200 at the cross-section 91-91. FIG. 92 is a top view of the glenoid implant 2200 with a cross-section 93-93. FIG. 93 is the side view of the glenoid implant 2200 at the cross-section 93-93. The glenoid implant 2200 includes a baseplate 2210 and a keel device 2230, which are similar to the baseplate 2110 and the keel device of the glenoid implant 2100. The keel device 2230 can be configured with a single center wedge component. In this configuration, more than one second fastening element 2215 will not pass through the keel device 2230, but will go directly into the scapula.

[0196] Referring generally to FIGS. 94-95, a glenoid implant 2300 is illustrated. FIGS. 94 and 95 are front and rear isometric exploded views of the glenoid implant 2300. The glenoid implant 2300 can include a reverse face plate 2330, a keel element 2360, a glenosphere 2350,

and a central fastening element 2310. The reverse face plate 2330 can include a protrusion element 2336 with a first central aperture 2340 therethrough. The reverse face plate 2330 can also include a receiving element 2335 opposite the protrusion element 2336. The receiving element 2335 can have a raised profile. The reverse face plate 2330 can also include apertures 2331 therethrough. Each of the apertures 2331 are positioned around the central aperture 2340. The keel element 2360 can include a second central aperture 2363. The keel element 2360 can include a threaded element 2365 to aid in securing the keel element to a portion of a scapula. Furthermore, the keel element 2360 can include a locking element 2361 configured to couple with the receiving element 2335 of the reverse plate 2330. The glenosphere 2350 can include a third central aperture 2352. The glenosphere 2350 can also include a receiving space 2351 with a unique profile that corresponds with the protrusion element 2336 of the reverse face plate 2330.

[0197] The central fastening element 2310 can be configured to be at least partially positioned through the first central aperture 2340 of the reverse face plate 2330, the second central aperture 2363 of the keel element 2360, and the third central aperture 2352 of the glenosphere 2350. The central fastening element 2310 can aid in coupling the glenosphere 2350 to the reverse face plate 2330 and the keel element 2360 to the reverse face plate 2330.

[0198] In some implementations, the receiving element 2335 of the reverse face plate 2330 includes splines configured to non-rotationally couple with corresponding grooves in the connecting element 2361 of the keel element 2360. In alternative implementations, the receiving element 2335 of the reverse face plate 2330 includes grooves configured to non-rotationally couple with corresponding splines in the connecting element 2361 of the keel element 2360.

[0199] Referring generally to FIGS. 96-97, a glenoid implant 2400 is illustrated. FIGS. 96 and 97 are front and rear isometric exploded views of the glenoid implant 2400. The glenoid

implant 2400 includes a reverse face plate 2430, a keel element 2460, a glenosphere 2450, and a central fastening element 2410, which are similar to the reverse face plate 2330, the keel element 2360, the glenosphere 2350, and the central fastening element 2310 of the glenoid implant 2300. The reverse face plate 2430 can include a receiving element 2440 in the place of the protrusion element 2336. The glenosphere 2450 can include a protrusion element 2452 configured to be received within the receiving element 2440 of the reverse face plate 2430. The glenosphere 2450 can also include wedge elements 2453 configured to abut the reverse face plate 2430 once coupled to the glenosphere 2450.

[0200] It is expressly contemplated that one or more elements from any of the above alternative implementations can be combined with one more elements from one or more others of the alternative implementations to provide additional alternative implementations.

[0201] While the present disclosure has been described with reference to one or more particular embodiments and implementations, those skilled in the art will recognize that many changes may be made thereto without departing from the spirit and scope of the present disclosure. Each of these embodiments and implementations and obvious variations thereof is contemplated as falling within the spirit and scope of the present disclosure, which is set forth in the claims that follow.

CLAIMS

What is claimed is:

1. A glenoid implant comprising:

a baseplate having a central aperture therethrough;

a first leg extending from the baseplate generally along a first arc, the first leg having a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient; and

a second leg extending from the baseplate generally along a second arc, the second leg having a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient.

2. The glenoid implant of claim 1, wherein a radius of curvature for the first arc is larger than a radius of curvature for the second arc.

3. The glenoid implant of claim 1, wherein a radius of curvature for the first arc is the same as a radius of curvature for the second arc.

4. The glenoid implant of claim 1, wherein a radius of curvature for the second arc is larger than a radius of curvature for the first arc.

5. The glenoid implant of claim 1, wherein the first portion of the scapula of the patient is an Acromion.

6. The glenoid implant of claim 1, wherein the second portion of the scapula of the patient is a Coracoid.

7. The glenoid implant of claim 1, further comprising a third leg extending from the baseplate generally along a third arc, the third leg having a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient.

8. The glenoid implant of claim 7, wherein a radius of curvature for the third arc is smaller than a radius of curvature for the second arc and a radius of curvature for the first arc.

9. The glenoid implant of claim 7, wherein a radius of curvature for the third arc is the same as a radius of curvature for the second arc and a radius of curvature for the first arc.

10. The glenoid implant of claim 7, wherein the third portion of the scapula of the patient is an Infraglenoid tubercle.

11. The glenoid implant of claim 7, wherein the baseplate, the first leg, the second leg, and the third leg form a single monolithic part.

12. The glenoid implant of claim 7, wherein the baseplate includes a first portion coupled to a second portion such that the central aperture is defined by both the first portion and the second portion.

13. The glenoid implant of claim 12, wherein the first portion of the baseplate, the first leg, and the second leg form a first monolithic part and wherein the second portion of the baseplate and the third leg form a second monolithic part that is separate and distinct from the first monolithic part.

14. The glenoid implant of claim 7, wherein the first leg, the second leg, and the third leg are curved to account for curvature of the first portion, second portion, and third portion of the scapula of the patient.

15. The glenoid implant of claim 7, wherein the first leg, the second leg, and the third leg extend generally along the first arc, the second arc, and the third arc, respectively, such that each of the first leg, the second leg, and the third leg has a radius of curvature.

16. The glenoid implant of claim 15, wherein the radius of curvature of the first leg, the second leg, and the third leg aid in a substantial portion of the glenoid implant directly abutting the first portion, second portion, and third portion, respectively, of the scapula of the patient.

17. The glenoid implant of claim 16, wherein at least seventy-five percent of a rear surface of the glenoid implant directly abuts the scapula of the patient prior to bone grafting material being applied.

18. The glenoid implant of claim 7, wherein the second leg is longer than the second leg and the third leg.

19. The glenoid implant of claim 1, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the baseplate to aid in securing the baseplate to a fourth portion of the scapula of the patient.

20. The glenoid implant of claim 19, wherein the fourth portion of the scapula of the patient is a glenoid cavity.

21. The glenoid implant of claim 19, wherein a head of the central fastening element is configured to be coupled with one or more additional components using a Morse taper press fit.

22. The glenoid implant of claim 19, wherein the head of the central fastening element is configured to be coupled with a humeral head.

23. The glenoid implant of claim 19, wherein the central fastening element includes a compression screw.

24. The glenoid implant of claim 19, wherein the central fastening element includes a lock screw.

25. The glenoid implant of claim 1, wherein the first fastening element and the second fastening element are configured to provide the glenoid implant with bi-cortical support.

26. The glenoid implant of claim 1, wherein the first fastening element and the second fastening element are configured to provide the glenoid implant with uni-cortical support.

27. A glenoid implant comprising:

a baseplate having a central aperture therethrough;

a first leg extending from the baseplate in a first direction, the first leg having a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient; and

a second leg extending from the baseplate in a second direction, the second leg having a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient.

28. The glenoid implant of claim 27, wherein the first portion of the scapula of the patient is an Acromion.

29. The glenoid implant of claim 27, wherein the second portion of the scapula of the patient is a Coracoid.

30. The glenoid implant of claim 27, further comprising a third leg extending from the baseplate generally in a third direction, the third leg having a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient.

31. The glenoid implant of claim 30, wherein the third portion of the scapula of the patient is an Infraglenoid tubercle.

32. The glenoid implant of claim 30, wherein the baseplate, the first leg, the second leg, and the third leg form a single monolithic part.

33. The glenoid implant of claim 30, wherein the baseplate includes a first portion coupled to a second portion such that the central aperture is defined by both the first portion and the second portion.

34. The glenoid implant of claim 33, wherein the first portion of the baseplate, the first leg, and the second leg form a first monolithic part and wherein the second portion of the baseplate and the third leg form a second monolithic part that is separate and distinct from the first monolithic part.

35. The glenoid implant of claim 30, wherein the first leg, the second leg, and the third leg are curved to account for curvature of the first portion, second portion, and third portion of the scapula of the patient.

36. The glenoid implant of claim 30, wherein the first leg, the second leg, and the third leg extend generally along a first arc, a second arc, and a third arc, respectively, such that each of the first leg, the second leg, and the third leg has a radius of curvature.

37. The glenoid implant of claim 36, wherein the radius of curvature of the first leg, the second leg, and the third leg aid in a substantial portion of the glenoid implant directly abutting the first portion, second portion, and third portion, respectively, of the scapula of the patient.

38. The glenoid implant of claim 37, wherein at least seventy-five percent of a rear surface of the glenoid implant directly abuts the scapula of the patient prior to bone grafting material being applied.

39. The glenoid implant of claim 27, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the baseplate to aid in securing the baseplate to a fourth portion of the scapula of the patient.

40. A glenoid implant comprising:

a base including a first portion and a second portion, the first portion having a first aperture therethrough and the second portion having a second aperture therethrough, the first aperture being configured to align with the second

aperture, thereby defining a central aperture of the base, responsive to the first portion being coupled to the second portion;

a first leg extending from the first portion of the base generally along a first arc, the first leg having a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient;

a second leg extending from the first portion of the base generally along a second arc, the second leg having a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient; and

an adjustable third leg extending from the second portion of the base generally along a third arc responsive to the first portion being coupled to the second portion, the third leg having a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient.

41. The glenoid implant of claim 40, wherein the first portion of the scapula of the patient is an Acromion.

42. The glenoid implant of claim 40, wherein the second portion of the scapula of the patient is a Coracoid.

43. The glenoid implant of claim 40, wherein the third portion of the scapula of the patient is an Infraglenoid tubercle.

44. The glenoid implant of claim 40, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base to aid in securing the base to a fourth portion of the scapula of the patient.

45. The glenoid implant of claim 44, wherein the fourth portion of the scapula of the patient is a glenoid cavity.

46. The glenoid implant of claim 44, further comprising a glenosphere configured to be secured to the base via the central fastening element.

47. The glenoid implant of claim 46, further comprising an offset element, the offset element aids in coupling the glenosphere to the base such that a central axis of the central aperture of the base is not aligned with a central axis of an aperture within the glenosphere,

48. The glenoid implant of claim 47, wherein the offset element comprises a base with a first coupling element protruding from a first surface of the base adjacent to a first end of the base and a second coupling element protruding from a second opposing surface of the base adjacent to a second opposing end of the base.

49. The glenoid implant of claim 40, wherein the first aperture of the first portion of the base includes splines configured to rotationally couple with corresponding grooves in the second aperture of the second portion of the base.

50. The glenoid implant of claim 49, wherein an angle between the adjustable third leg and the first leg adjustable can be adjusted to account for a distance between the first portion of the scapula of the patient and the third portion of the scapula of the patient.

51. The glenoid implant of claim 40, wherein the first aperture of the first portion of the base includes grooves configured to non-rotationally couple with corresponding splines in the second aperture of the second portion of the base.

52. The glenoid implant of claim 40, further comprising an augment configured to be coupled to at least one of the first leg, the second leg, and the adjustable third leg to increase a relative thickness thereof.

53. The glenoid implant of claim 40, further comprising an augment configured to be coupled to the first leg to increase a relative thickness of the first leg.

54. The glenoid implant of claim 53, wherein the augment comprises at least one slot configured to receive an at least one projection extending from the first leg such that the augment slides onto and is coupled to the first leg.

55. The glenoid implant of claim 53, wherein the augment comprises a corresponding aperture that aligns with the first aperture in the first leg such that the first fastening element is configured to be received through the first aperture of the first leg and the augment aperture to aid in coupling the first leg and the augment to the first portion of the scapula of the patient.

56. The glenoid implant of claim 40, further comprising an augment configured to be coupled to the third leg to increase a relative thickness of the third leg.

57. The glenoid implant of claim 5653, wherein the augment comprises at least one slot configured to receive an at least one projection extending from the third leg such that the augment slides onto and is coupled to the third leg.

58. The glenoid implant of claim 5653, wherein the augment comprises a corresponding aperture that aligns with the third aperture in the third leg such that the third fastening element is configured to be received through the third aperture of the third leg and the augment aperture to aid in coupling the third leg and the augment to the third portion of the scapula of the patient.

59. The glenoid implant of claim 40, wherein the first leg, the second leg, and the removable leg comprises a first thickness that enables a 5 mm offset for the glenoid implant from the scapula of the patient.

60. The glenoid implant of claim 40, wherein the first leg, the second leg, and the removable leg comprises a first thickness that enables a 10 mm offset for the glenoid implant from the scapula of the patient.

61. The glenoid implant of claim 40, wherein the scapula contacting surface of one or more of the first leg, the second leg, and the adjustable third leg includes a

convex surface and the scapula contacting surface of one or more of the first leg, the second leg, and the adjustable third leg includes a concave surface.

62. The glenoid implant of claim 40, wherein the adjustable third leg comprises a convex surface along the third arc, the convex surface contacts the third portion of the scapula of the patient.

63. The glenoid implant of claim 40, wherein the first leg comprises a convex surface along the first arc, the convex surface contacts the first portion of the scapula of the patient.

64. The glenoid implant of claim 40, wherein the second leg comprises a convex surface along the third arc, the convex surface contacts the second portion of the scapula of the patient.

65. The glenoid implant of claim 40, wherein the first leg, the second leg, and the third leg extend generally along a first arc, a second arc, and a third arc, respectively, such that each of the first leg, the second leg, and the third leg has a radius of curvature.

66. The glenoid implant of claim 65, wherein the radius of curvature of the first leg, the second leg, and the third leg aid in a substantial portion of the glenoid implant directly abutting the first portion, second portion, and third portion, respectively, of the scapula of the patient.

67. The glenoid implant of claim 40, wherein the first leg is configured as a wedge shape where a flat first surface is adjacent to the first aperture, and a curved second surface is configured to coincide with a surface of the first portion of a scapula of a patient.

68. The glenoid implant of claim 40, wherein the second leg is configured as a wedge shape where a flat first surface is adjacent to the second aperture, and a curved second surface is configured to coincide with a surface of the second portion of a scapula of a patient.

69. A glenoid implant comprising:

a base including a first portion and a second portion, the first portion having a first aperture therethrough and the second portion having a second aperture therethrough, the first aperture being configured to align with the second aperture, thereby defining a central aperture of the base, responsive to the first portion being coupled to the second portion;

a first leg extending from the first portion of the base generally along a first arc, the first leg having a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient;

a second leg extending from the first portion of the base generally along a second arc, the second leg having a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient;

an adjustable third leg extending from the second portion of the base generally along a third arc responsive to the first portion being coupled to the second portion, the third leg having a third aperture therein configured to receive a portion of a third fastening element therethrough to aid in securing the third leg to a third portion of the scapula of the patient;

a keel element extending from a rear surface of the adjustable third leg configured to fit into a cavity defect of the third portion of the scapula of the patient.

70. The glenoid implant of claim 69, wherein the first portion of the scapula of the patient is an Acromion.

71. The glenoid implant of claim 69, wherein the second portion of the scapula of the patient is a glenoid cavity.

72. The glenoid implant of claim 69, wherein the third portion of the scapula of the patient is a Coracoid.

73. The glenoid implant of claim 69, wherein the fourth portion of the scapula of the patient is an Infraglenoid tubercle.

74. The glenoid implant of claim 69, wherein the baseplate includes a first portion coupled to a second portion such that the central aperture is defined by both the first portion and the second portion.

75. The glenoid implant of claim 74, wherein the first portion of the baseplate and the third adjustable leg form a first monolithic part and wherein the second portion of the baseplate, the first leg, and the second leg form a second monolithic part that is separate and distinct from the first monolithic part.

76. The glenoid implant of claim 69, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base to aid in securing the base to a fourth portion of the scapula of the patient.

77. The glenoid implant of claim 76, wherein the fourth portion of the scapula of the patient is a glenoid cavity.

78. The glenoid implant of claim 76, further comprising a glenosphere configured to be secured to the base via the central fastening element.

79. The glenoid implant of claim 78, further comprising an augment configured to be coupled to an aperture within the glenosphere.

80. The glenoid implant of claim 69, wherein the first aperture of the first portion of the base includes splines configured to non-rotationally couple with corresponding grooves in the second aperture of the second portion of the base.

81. The glenoid implant of claim 80, wherein an angle between the adjustable third leg and the first leg adjustable can be adjusted to account for a distance between

the first portion of the scapula of the patient and the third portion of the scapula of the patient.

82. The glenoid implant of claim 69, wherein the first aperture of the first portion of the base includes grooves configured to non-rotationally couple with corresponding splines in the second aperture of the second portion of the base.

83. The glenoid implant of claim 69, further comprising an insert configured to be coupled to the first leg to increase a relative thickness of the first leg.

84. The glenoid implant of claim 83, wherein the insert comprises a corresponding aperture that aligns with the first aperture in the first leg such that the first fastening element is configured to be received through the first aperture of the first leg and the insert aperture to aid in coupling the first leg and the insert to the first portion of the scapula of the patient.

85. The glenoid implant of claim 69, wherein the scapula contacting surface of one or more of the first leg, the second leg, and the adjustable third leg includes a convex surface and the scapula contacting surface of one or more of the first leg, the second leg, and the adjustable third leg includes a concave surface.

86. The glenoid implant of claim 69, wherein the adjustable third leg comprises a convex surface along the third arc, the convex surface contacts the third portion of the scapula of the patient.

87. The glenoid implant of claim 69, wherein the first leg comprises a convex surface along the first arc, the convex surface contacts the first portion of the scapula of the patient.

88. The glenoid implant of claim 69, wherein the second leg comprises a convex surface along the third arc, the convex surface contacts the second portion of the scapula of the patient.

89. The glenoid implant of claim 69, wherein the first leg, the second leg, and the third leg extend generally along a first arc, a second arc, and a third arc, respectively, such that each of the first leg, the second leg, and the third leg has a radius of curvature.

90. The glenoid implant of claim 89, wherein the radius of curvature of the first leg, the second leg, and the third leg aid in a substantial portion of the glenoid implant directly abutting the first portion, second portion, and third portion, respectively, of the scapula of the patient.

91. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element, the keel element is configured to secure the base element to a first portion of a scapula of a patient,

wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient,

a coupling element having a first elongated portion and a second portion, the first elongated portion comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element; and

an augment configured to be received within a receiving space of the first elongated portion of the coupling element, the augment comprising a second plurality of apertures therethrough, wherein each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient,

wherein the coupling element and the augment is configured to rotate about the base element.

92. The glenoid implant of claim 91, wherein the first portion of the scapula of the patient is a glenoid cavity.

93. The glenoid implant of claim 91, wherein the base element is configured as an inlay component.

94. The glenoid implant of claim 91, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the

base element and the central aperture of the coupling element to aid in coupling the base element and the coupling element to the first portion of the scapula of the patient.

95. The glenoid implant of claim 94, wherein a head of the central fastening element is configured to secure additional components using a Morse taper press fit.

96. The glenoid implant of claim 95, wherein the head of the central fastening element is configured to secure a humeral head.

97. The glenoid implant of claim 94, wherein the central fastening element includes a compression screw.

98. The glenoid implant of claim 94, wherein the central fastening element includes a lock screw.

99. The glenoid implant of claim 91, further comprising a glenosphere configured to be secured to the coupling element via the central fastening element.

100. The glenoid implant of claim 99, wherein the glenosphere base comprises a male receiving element configured to receive the central fastening element.

101. The glenoid implant of claim 91, wherein the second fastening element is configured to provide the glenoid implant with bi-cortical support.

102. The glenoid implant of claim 91, wherein the second fastening element is configured to provide the glenoid implant with uni-cortical support.

103. A glenoid implant comprising:

a base element having a central aperture therethrough and a second aperture therethrough, the second aperture being configured to receive a portion of a first fastening element therethrough to aid in coupling the base element to a first portion of a scapula of a patient,

a coupling element having a plurality of apertures therethrough and a central aperture aligned with the central aperture of the base element, wherein each aperture of the plurality of apertures is configured to receive a portion of a second fastening element therethrough to aid in securing the coupling element to a second portion of the scapula of the patient, and

wherein the coupling element is configured to rotate about the base element.

104. The glenoid implant of claim 103, wherein the first portion of the scapula of the patient is a glenoid cavity.

105. The glenoid implant of claim 103, wherein the base element is configured as an onlay component.

106. The glenoid implant of claim 103, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to

aid in securing the base element and the coupling element to the first portion of the scapula of the patient.

107. The glenoid implant of claim 106, wherein a head of the central fastening element is configured to secure additional components using a Morse taper press fit.

108. The glenoid implant of claim 107, wherein the head of the central fastening element is configured to secure a humeral head.

109. The glenoid implant of claim 106, wherein the central fastening element includes a compression screw.

110. The glenoid implant of claim 106, wherein the central fastening element includes a lock screw.

111. The glenoid implant of claim 103, further comprising a glenosphere configured to be secured to the coupling element via the central fastening element.

112. The glenoid implant of claim 111, further comprising an augment configured to be coupled to an aperture within the glenosphere.

113. The glenoid implant of claim 111, wherein the glenosphere comprises a male receiving element configured to receive the central fastening element.

114. The glenoid implant of claim 103, wherein the second fastening element is configured to provide the glenoid implant with bi-cortical support.

115. The glenoid implant of claim 103, wherein the second fastening element is configured to provide the glenoid implant with uni-cortical support.

116. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element, the keel element configured to secure the base element to a first portion of a scapula of a patient,

wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient,

a coupling element having a first elongated portion and a second portion, the first elongated portion comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element; and

an augment configured to be received within a receiving space of the first elongated portion of the coupling element, the augment comprising a second plurality of apertures therethrough, wherein each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient,

wherein the coupling element and the augment are configured to rotate about the base element.

117. The glenoid implant of claim 116, wherein the first portion of the scapula of the patient is a glenoid cavity.

118. The glenoid implant of claim 116, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to aid in securing the base element and the coupling element to the first portion of the scapula of the patient.

119. The glenoid implant of claim 118, wherein the central fastening element includes a compression screw.

120. The glenoid implant of claim 118, wherein the central fastening element includes a lock screw.

121. The glenoid implant of claim 118, further comprising a double trunnion element configured to receive the central fastening element at a first end of the double trunnion element and a threaded element at a second end of the double trunnion element.

122. The glenoid implant of claim 121, further comprising a glenosphere configured to be secured to the coupling element via the threaded element.

123. The glenoid implant of claim 122, wherein the glenosphere comprises a female receiving element configured to receive the threaded element and the second end of the double trunnion element.

124. The glenoid implant of claim 116, wherein the second fastening element is configured to provide the glenoid implant with bi-cortical support.

125. The glenoid implant of claim 116, wherein the second fastening element is configured to provide the glenoid implant with uni-cortical support.

126. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a male receiving element on a rear end of the base element, the second aperture being configured to receive a portion of a first fastening element therethrough to aid in coupling the base element to a first portion of a scapula of a patient,

a coupling element having a first elongated portion and a second portion, the first elongated portion comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element; and

an augment configured to be received within a receiving space of the first elongated portion of the coupling element, the augment comprising a second plurality of

apertures therethrough, wherein each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient,

wherein the coupling element and the augment are configured to rotate about the base element.

127. The glenoid implant of claim 126, further comprising a removable wedge element comprising an aperture, the aperture configured to receive the male receiving element of the base element and a third fastening element therethrough to aid in securing the removable wedge element to the base element.

128. The glenoid implant of claim 127, wherein the removable wedge element is configured to fit into a cavity defect of the first portion of the scapula of the patient.

129. The glenoid implant of claim 126, wherein the first portion of the scapula of the patient is a glenoid cavity.

130. The glenoid implant of claim 126, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to

aid in securing the base element and the coupling element to the first portion of the scapula of the patient.

131. The glenoid implant of claim 130, wherein a head of the central fastening element is configured to secure additional components using a Morse taper press fit.

132. The glenoid implant of claim 131, wherein the head of the central fastening element is configured to secure a humeral head.

133. The glenoid implant of claim 130, wherein the central fastening element includes a compression screw.

134. The glenoid implant of claim 130, wherein the central fastening element includes a lock screw.

135. The glenoid implant of claim 130, further comprising a glenosphere configured to be secured to the coupling element via the central fastening element.

136. The glenoid implant of claim 135, further comprising an augment configured to be coupled to an aperture within the glenosphere.

137. The glenoid implant of claim 135, wherein the glenosphere comprises a male receiving element configured to receive the central fastening element.

138. The glenoid implant of claim 126, wherein the second fastening element is configured to provide the glenoid implant with bi-cortical support.

139. The glenoid implant of claim 126, wherein the second fastening element is configured to provide the glenoid implant with uni-cortical support.

140. The glenoid implant of claim 135, further comprising an offset element, the offset element aids in coupling the glenosphere to the base such that a central axis of the central aperture of the base is not aligned with a central axis of an aperture within the glenosphere,

141. The glenoid implant of claim 140, wherein the offset element comprises a base with a first coupling element protruding from a first surface of the base adjacent to a first end of the base and a second coupling element protruding from a second opposing surface of the base adjacent to a second opposing end of the base.

142. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a male receiving element on a rear end of the base element, wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to a first portion of a scapula of a patient;

a removable wedge element comprising an aperture, the aperture configured to receive the male receiving element of the base element and a third fastening element therethrough to aid in securing the removable wedge element to the base element;

a central fastening element configured to be at least partially positioned through the central aperture of the base element to aid in securing the base element to the first portion of the scapula of the patient; and

a glenosphere configured to be coupled to the base element via the central fastening element.

143. The glenoid implant of claim 142, wherein the first fastening element is configured to provide the glenoid implant with uni-cortical support.

144. The glenoid implant of claim 142, wherein the first portion of the scapula of the patient is a glenoid cavity.

145. The glenoid implant of claim 142, wherein the central fastening element includes a compression screw.

146. The glenoid implant of claim 142, wherein the central fastening element includes a lock screw.

147. The glenoid implant of claim 142, wherein the glenosphere comprises a male receiving element configured to receive the central fastening element.

148. The glenoid implant of claim 142, further comprising an augment configured to be coupled to an aperture within the glenosphere.

149. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element, the keel element configured to secure the base element to a first portion of a scapula of a patient,

wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient,

a coupling element having a first elongated portion and a second portion, the first elongated body comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element, wherein each aperture of the plurality of apertures is configured to receive a portion of a second fastening element therethrough to aid in securing the coupling element to a second portion of the scapula of the patient, and

wherein the first elongated portion of the coupling element is positioned to a first side of the base element.

150. The glenoid implant of claim 149, wherein the first portion of the scapula of the patient is a glenoid cavity.

151. The glenoid implant of claim 149, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to

aid in securing the base element and the coupling element to the first portion of the scapula of the patient.

152. The glenoid implant of claim 151, wherein the central fastening element includes a compression screw.

153. The glenoid implant of claim 151, wherein the central fastening element includes a lock screw.

154. The glenoid implant of claim 151, further comprising a double trunnion element configured to receive the central fastening element at a first end of the double trunnion element and a threaded element at a second end of the double trunnion element.

155. The glenoid implant of claim 154, further comprising a glenosphere configured to be secured to the coupling element via the threaded element.

156. The glenoid implant of claim 155, wherein the glenosphere comprises a female receiving element configured to receive the threaded element and the second end of the double trunnion element.

157. The glenoid implant of claim 149, wherein the second fastening element is configured to provide the glenoid implant with bi-cortical support.

158. The glenoid implant of claim 149, wherein the second fastening element is configured to provide the glenoid implant with uni-cortical support.

159. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a keel element extending from a rear of the base element, the keel element is configured to secure the base element to a first portion of a scapula of a patient,

wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient;

a coupling element having a first elongated portion and a second portion, the first elongated portion comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element; and

an augment configured to be received within a receiving space of the first elongated portion of the coupling element, the augment comprising a second plurality of apertures therethrough, wherein each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient,

wherein the coupling element and the augments are positioned to a first side of the base element.

160. The glenoid implant of claim 159, wherein the first portion of the scapula of the patient is a glenoid cavity.

161. The glenoid implant of claim 159, wherein the base element is configured as an inlay component.

162. The glenoid implant of claim 159, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to aid in coupling the base element and the coupling element to the first portion of the scapula of the patient.

163. The glenoid implant of claim 162, wherein a head of the central fastening element is configured to secure additional components using a Morse taper press fit.

164. The glenoid implant of claim 163, wherein the head of the central fastening element is configured to secure a humeral head.

165. The glenoid implant of claim 162, wherein the central fastening element includes a compression screw.

166. The glenoid implant of claim 162, wherein the central fastening element includes a lock screw.

167. A glenoid implant comprising:

a base element having a central aperture therethrough, a second aperture therethrough, and a wedge element extending from a rear of the base element, the wedge element is configured to secure the base element to a first portion of a scapula of a patient, wherein the second aperture is configured to receive a portion of a first fastening element therethrough to aid in securing the base element to the first portion of the scapula of the patient,

a coupling element having a first elongated portion and a second portion, the first elongated portion comprising a plurality of apertures therethrough and the second portion comprising a central aperture aligned with the central aperture of the base element; and

an augment configured to be received within a receiving space of the first elongated portion of the coupling element, the augment comprising a second plurality of apertures therethrough, wherein each aperture of the first plurality of apertures is aligned with each aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the coupling element and the augment to a second portion of the scapula of the patient;

wherein the coupling element and the augment are configured to rotate about the base element.

168. The glenoid implant of claim 167, wherein the first portion of the scapula of the patient is a glenoid cavity.

169. The glenoid implant of claim 167, further comprising a central fastening element configured to be at least partially positioned through the central aperture of the base element and the central aperture of the coupling element to aid in securing the base element and the coupling element to the first portion of the scapula of the patient.

170. The glenoid implant of claim 169, wherein a head of the central fastening element is configured to secure additional components using a Morse taper press fit.

171. The glenoid implant of claim 170, wherein the head of the central fastening element is configured to secure a humeral head.

172. The glenoid implant of claim 169, wherein the central fastening element includes a compression screw.

173. The glenoid implant of claim 169, wherein the central fastening element includes a lock screw.

174. The glenoid implant of claim 169, further comprising a glenosphere configured to be secured to the coupling element via the central fastening element.

175. The glenoid implant of claim 174, further comprising an augment configured to be coupled to an aperture within the glenosphere.

176. The glenoid implant of claim 174, further comprising an offset element, the offset element aids in coupling the glenosphere to the base such that a central axis of the central aperture of the base is not aligned with a central axis of an aperture within the glenosphere,

177. The glenoid implant of claim 176, wherein the offset element comprises a base with a first coupling element protruding from a first surface of the base adjacent to a first end of the base and a second coupling element protruding from a second opposing surface of the base adjacent to a second opposing end of the base.

178. The glenoid implant of claim 167, wherein the wedge element comprises a first thickness at the central aperture, and a second thickness at the second aperture, wherein the first thickness is thicker than the second thickness.

179. The glenoid implant of claim 167, wherein the wedge element comprises a first thickness at the central aperture, and a second thickness at the second aperture, wherein the second thickness is thicker than the first thickness.

180. A glenoid implant comprising:

a baseplate having a central aperture therethrough and a plurality of apertures therethrough, each of the plurality of apertures are positioned around the central aperture; and

a keel element extending from a rear of the baseplate, the keel element comprising a central aperture aligned with the central aperture of the base element and a plurality of grooves, wherein each aperture of the plurality of apertures is aligned with each groove of the plurality of grooves to receive a portion of a second fastening element therethrough to aid in securing the wedge element to a first portion of a scapula of a patient,

wherein the keel element is shaped to account for a cavity defect of a first portion of a scapula of a patient.

181. The glenoid implant of claim 180, wherein the keel element comprises a non-uniform shape.

182. A glenoid implant comprising:

a baseplate having a central aperture therethrough and a first plurality of apertures therethrough, each of the plurality of apertures are positioned around the central aperture; and

a keel element extending from a rear of the baseplate, the keel element comprising a central aperture aligned with the central aperture of the base element and a second plurality of apertures, wherein at least one aperture of the first plurality of apertures is aligned with at least one aperture of the second plurality of apertures to receive a portion of a second fastening element therethrough to aid in securing the wedge element to a first portion of a scapula of a patient.

183. The glenoid implant of claim 182, wherein the keel element comprises an elongated quadrilateral portion and a second portion extending from the elongated quadrilateral portion.

184. The glenoid implant of claim 183, wherein the elongated quadrilateral portion comprises the central aperture and at least two apertures of the second plurality of apertures, and the second portion comprises one aperture of the second plurality of apertures.

185. The glenoid implant of claim 182, wherein the keel element comprises an elongated quadrilateral portion having the central aperture and at least two apertures of the second plurality of apertures.

186. A glenoid implant comprising:

a reverse face plate having a protrusion element with a first central aperture therethrough, a receiving element opposite the protrusion element, and a first plurality of apertures therethrough, each of the plurality of apertures are positioned around the central aperture;

a keel element having a second central aperture, a threaded element to aid in securing the keel element to a first portion of a scapula of a patient, a connecting element configured to couple with the receiving element of the reverse plate;

a glenosphere having a third central aperture and a receiving space configured to receive the protrusion element of the reverse face plate; and

a central fastening element configured to be at least partially positioned through the first central aperture of the reverse face plate, the second central aperture of the

keel element, and the third central aperture of the glenosphere to aid in coupling the glenosphere to the reverse face plate and the keel element to the reverse face plate.

187. The glenoid implant of claim 186, wherein the receiving element of the reverse face plate includes splines configured to non-rotationally couple with corresponding grooves in the connecting element of the keel element.

188. The glenoid implant of claim 186, wherein the receiving element of the reverse face plate includes grooves configured to non-rotationally couple with corresponding splines in the connecting element of the keel element.

189. A glenoid implant comprising:

a reverse face plate having a first receiving element with a first central aperture therethrough, a second receiving element opposite the first receiving element, and a first plurality of apertures therethrough, each of the plurality of apertures are positioned around the first receiving element;

a keel element having a second central aperture, a threaded element to aid in securing the keel element to a first portion of a scapula of a patient, a connecting element configured to couple with the second receiving element of the reverse plate;

a glenosphere having a third central aperture and a protrusion element configured to be received within the first receiving element of the reverse face plate; and

a central fastening element configured to be at least partially positioned through the first central aperture of the reverse face plate, the second central aperture of the keel element, and the third central aperture of the glenosphere to aid in coupling

the glenosphere to the reverse face plate and the keel element to the reverse face plate.

190. The glenoid implant of claim 189, wherein the receiving element of the reverse face plate includes splines configured to non-rotationally couple with corresponding grooves in the connecting element of the keel element.

191. The glenoid implant of claim 189, wherein the receiving element of the reverse face plate includes grooves configured to non-rotationally couple with corresponding splines in the connecting element of the keel element.

ABSTRACT

A glenoid implant includes a baseplate, a first leg and a second leg. The baseplate includes a central aperture therethrough. The first leg extends from the baseplate generally along a first arc. The first leg includes a first aperture therein configured to receive a portion of a first fastening element therethrough to aid in securing the first leg to a first portion of a scapula of a patient. The second leg extends from the baseplate generally along a second arc. The second leg includes a second aperture therein configured to receive a portion of a second fastening element therethrough to aid in securing the second leg to a second portion of the scapula of the patient.