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(54) **IMPLANTS, SYSTEMS AND METHODS OF USING THE SAME**

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(22) Filed: **May 8, 2025**

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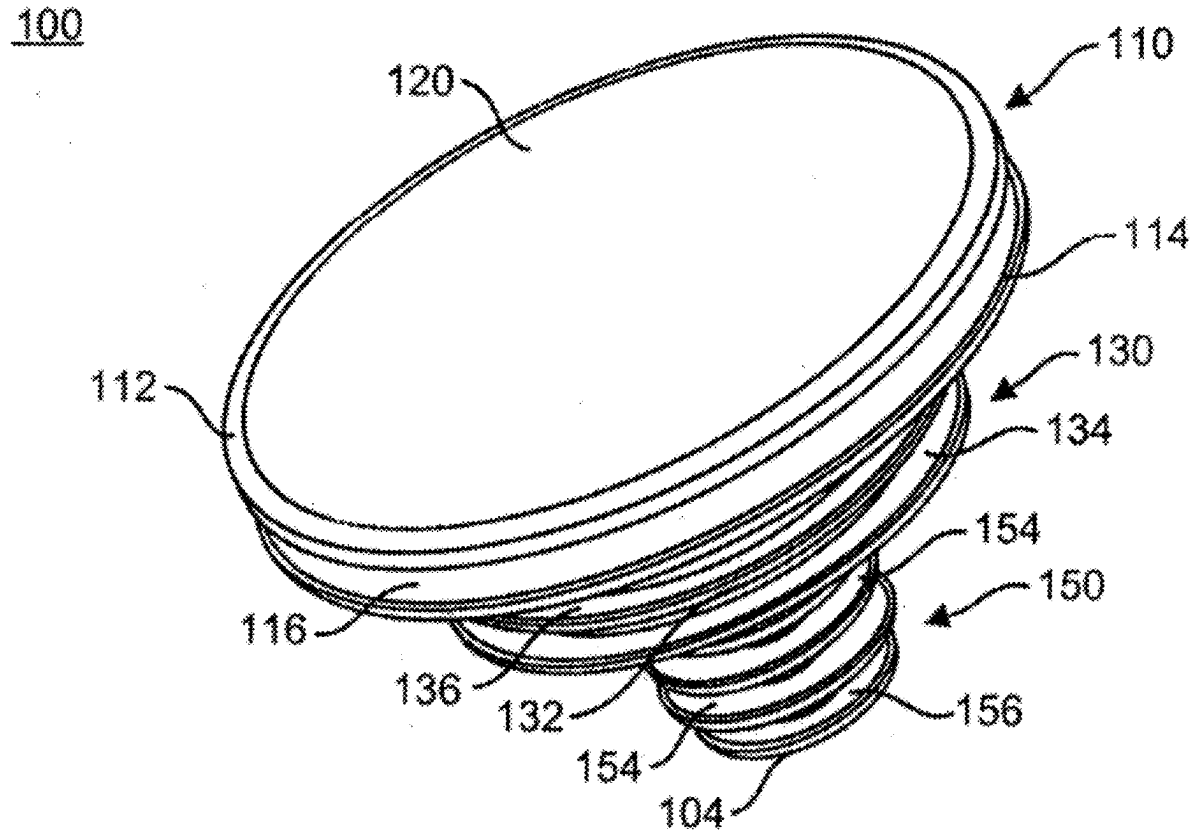
(52) **U.S. Cl.**
CPC ***A61F 2/4081*** (2013.01); ***A61F 2/30771*** (2013.01); *A61F 2002/30881* (2013.01); *A61F 2002/30886* (2013.01)

(57) **ABSTRACT**

Implants, device, systems and methods for replacing an articulation surface in a joint, for example, a glenoid implant with an articular surface and an opposing bone contacting surface having a ring and post extending therefrom that respectively mechanically connect with cortical bone and cancellous bone of a glenoid. Methods for implanting the glenoid implant are also disclosed.



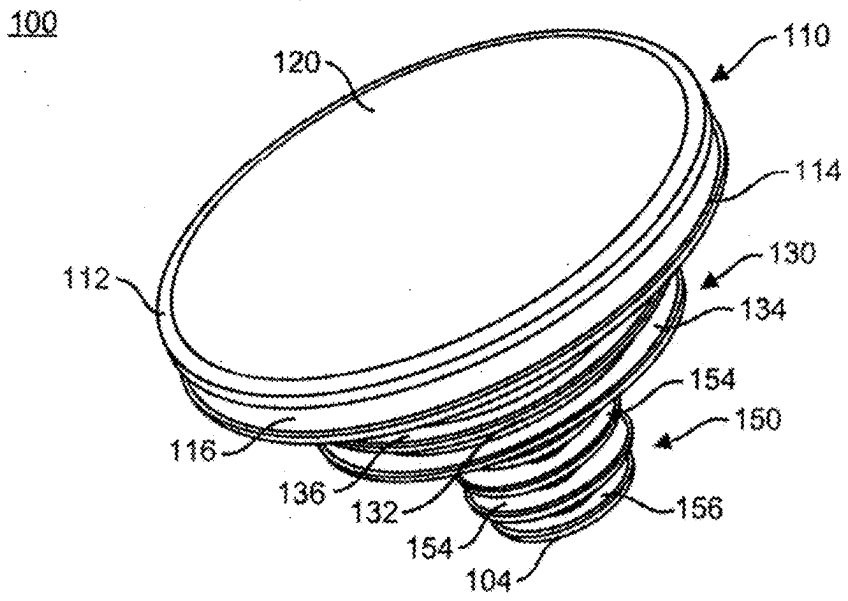

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FIG. 1

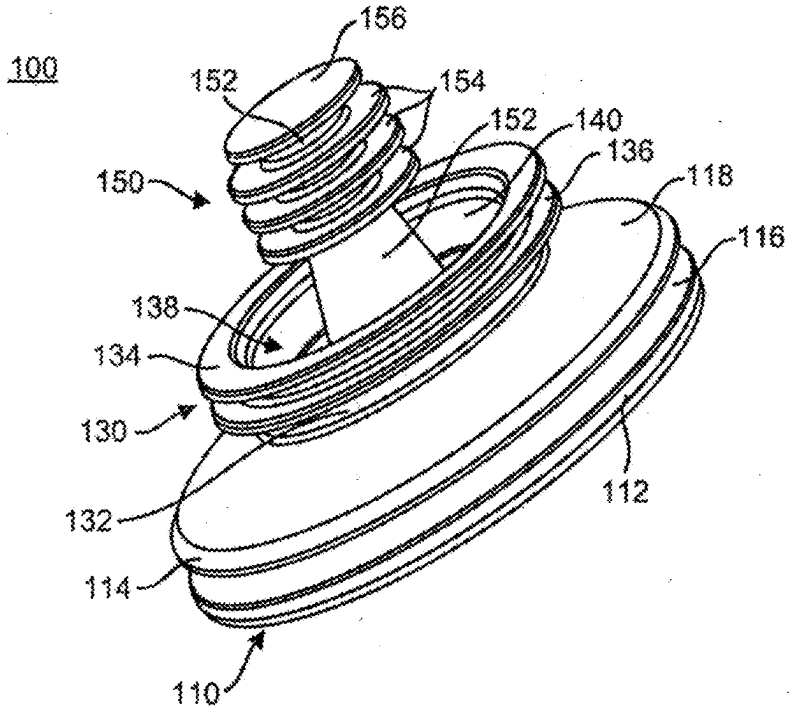
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FIG. 2

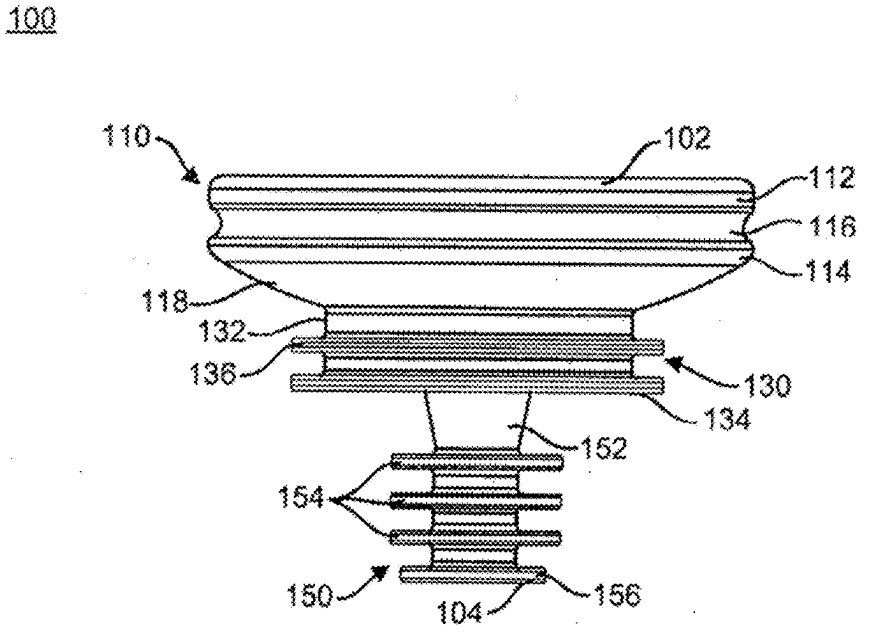
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FIG. 3

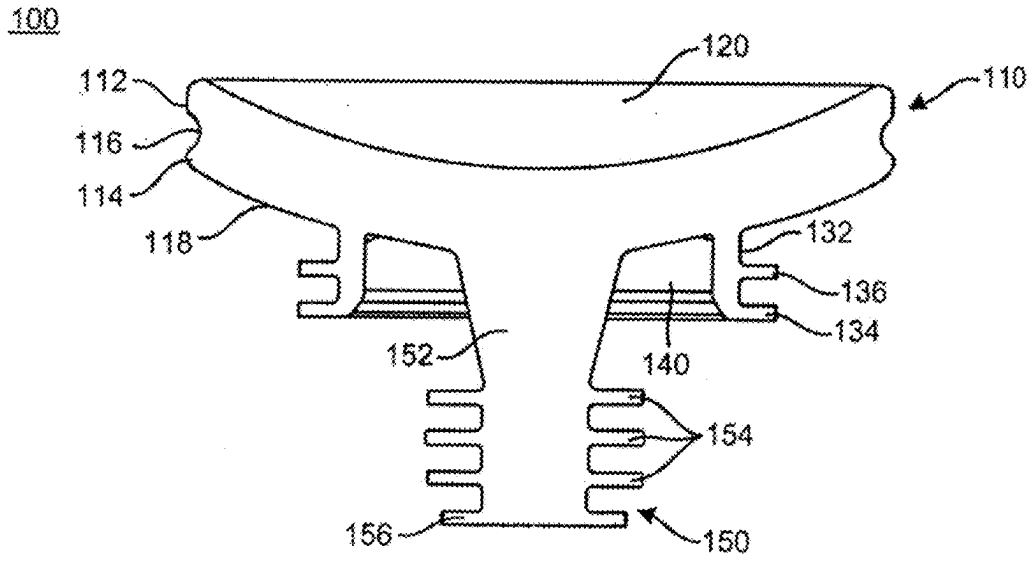
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FIG. 4

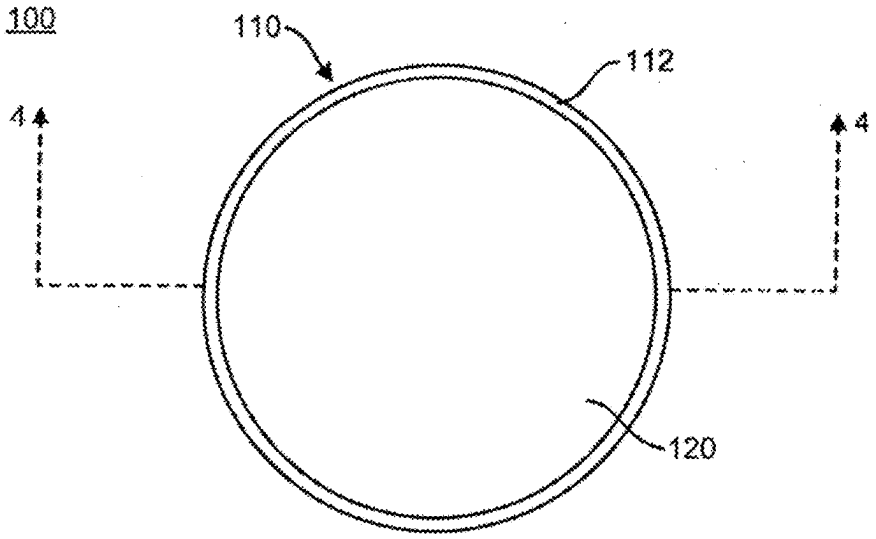
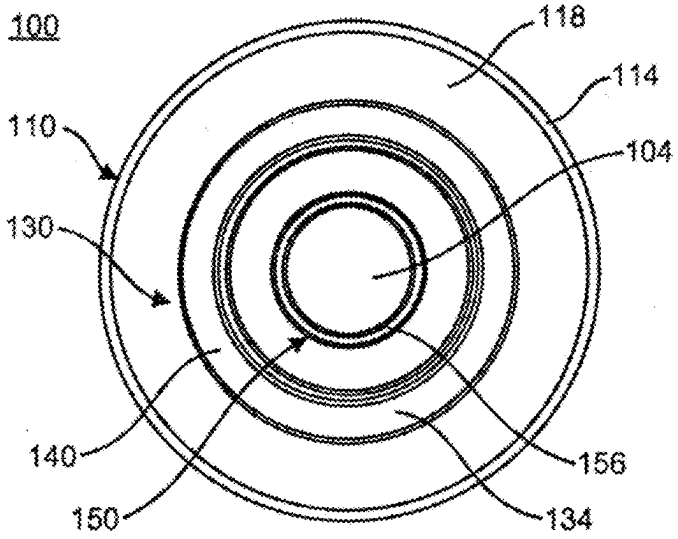


FIG. 5



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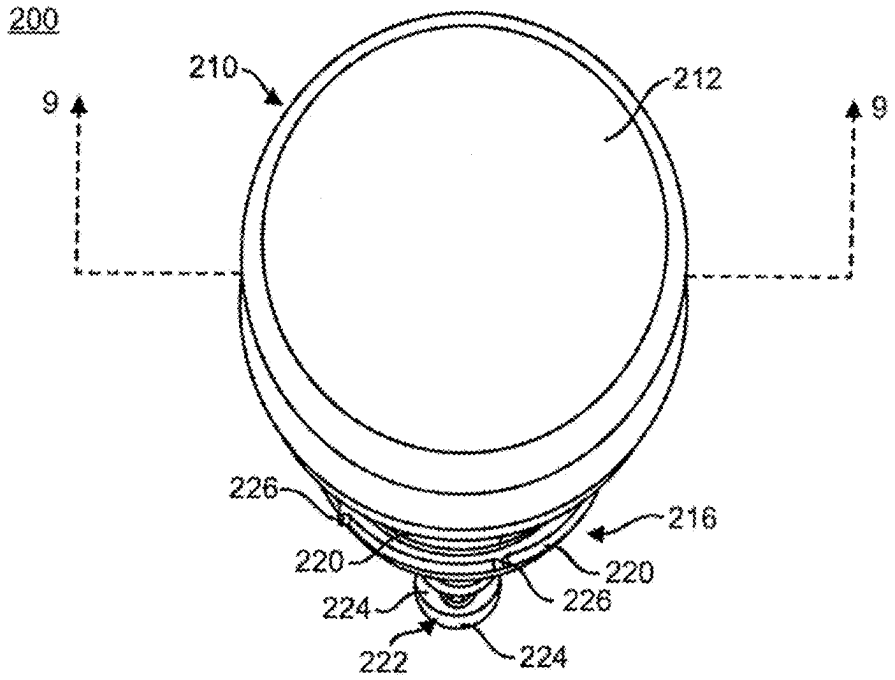
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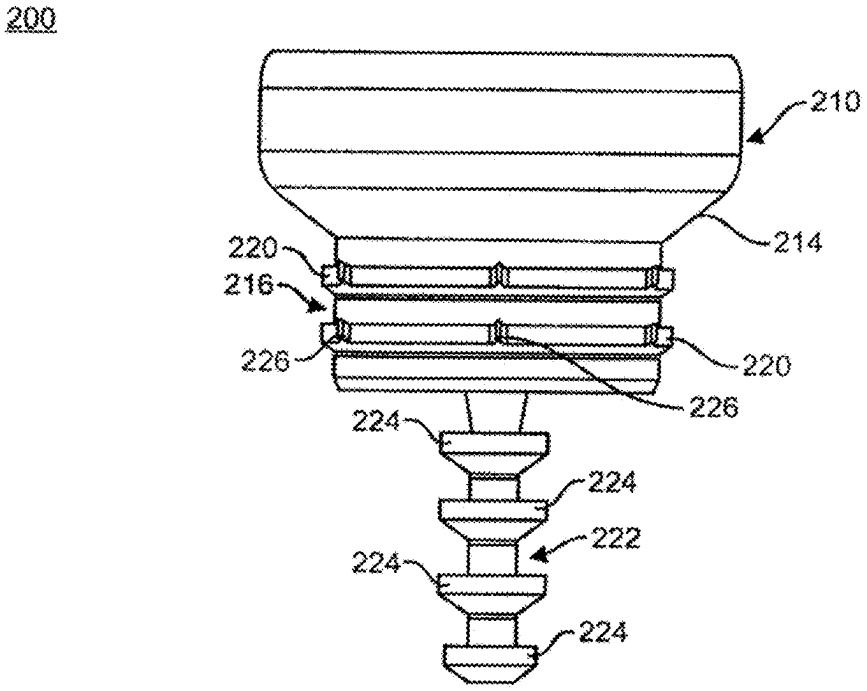
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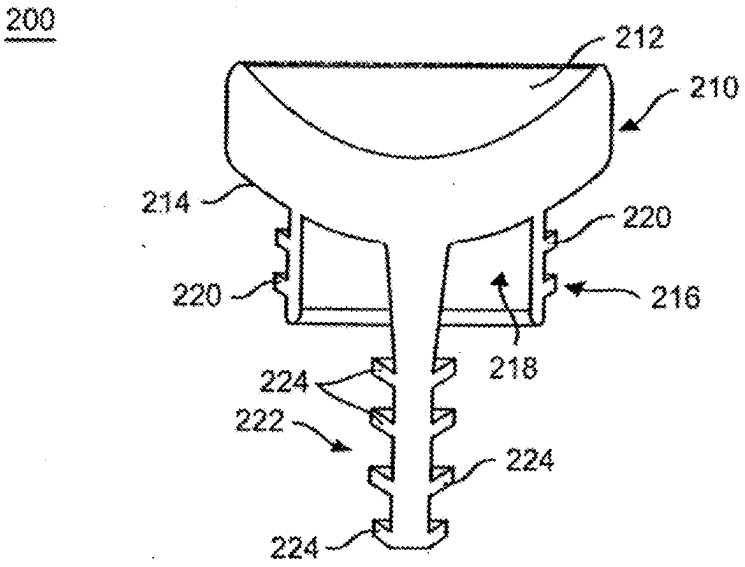

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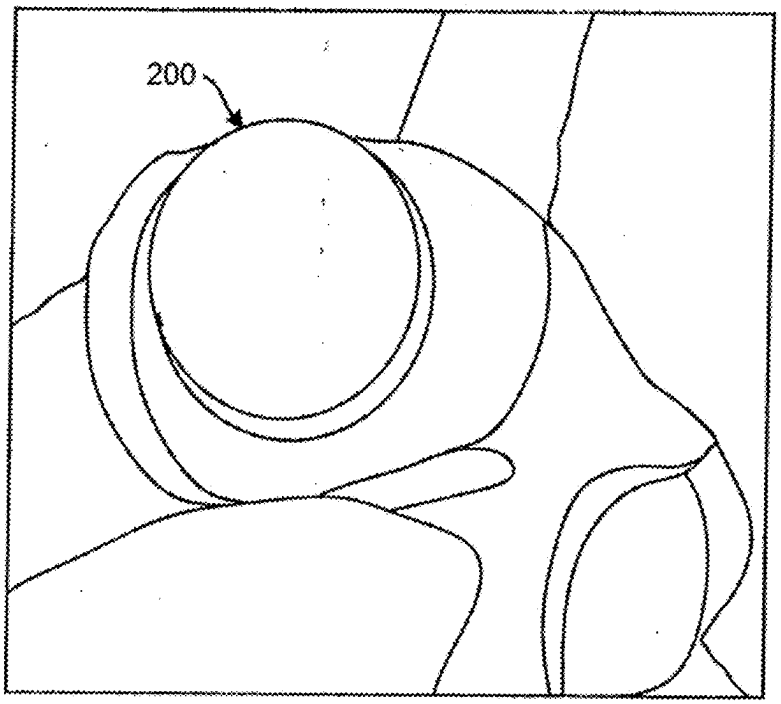

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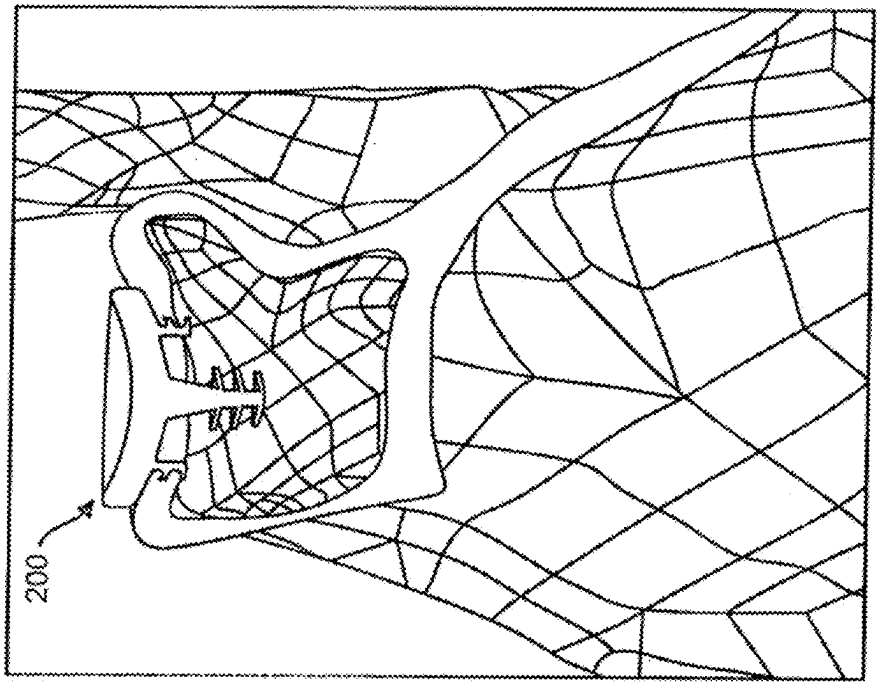

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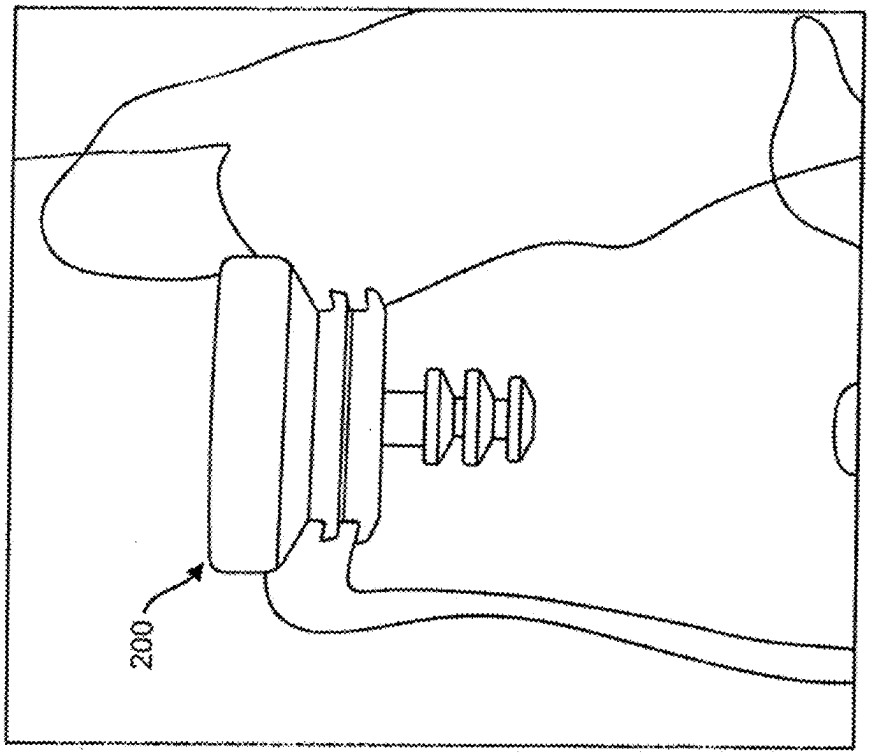

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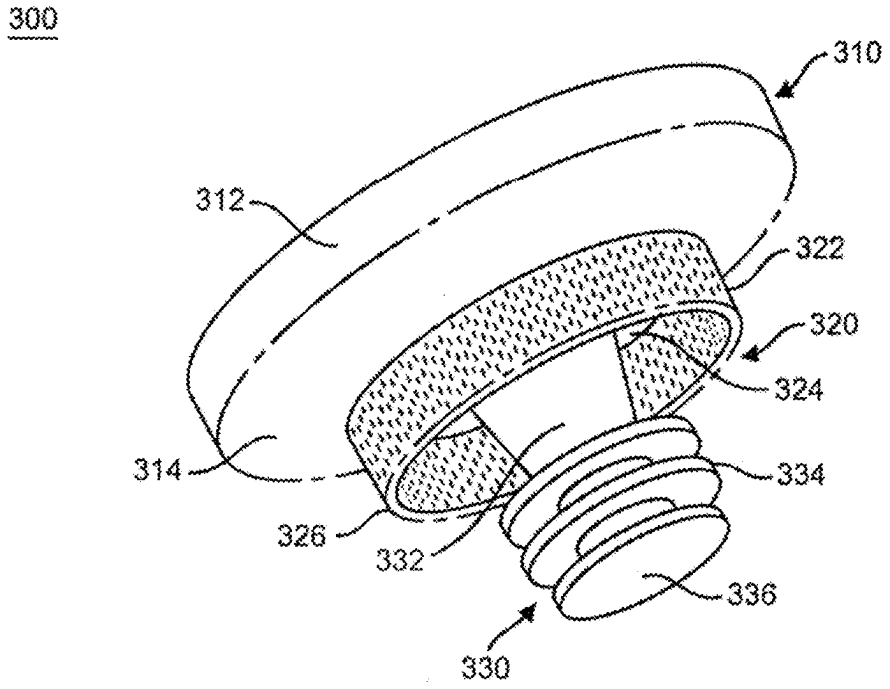
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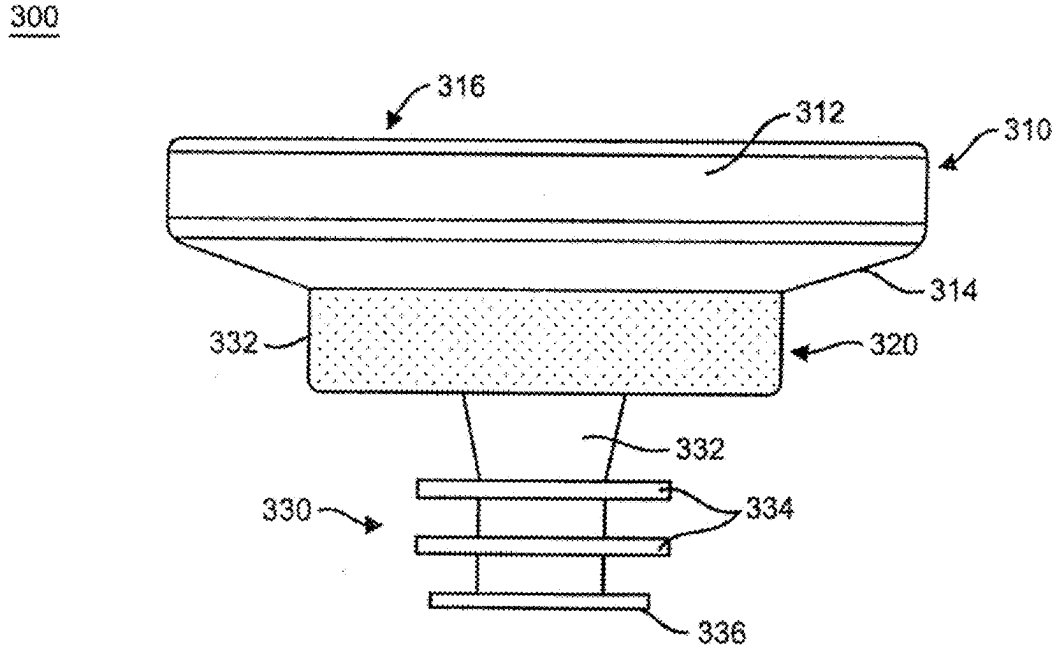
FIG. 13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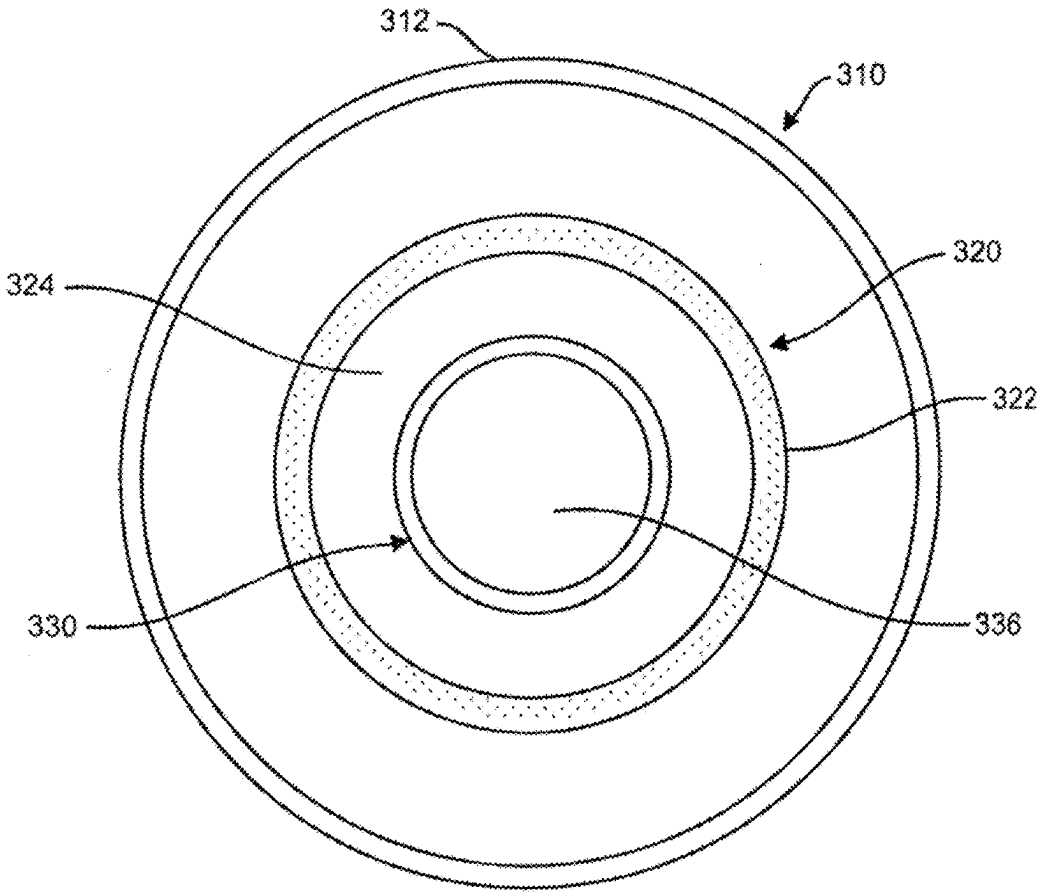

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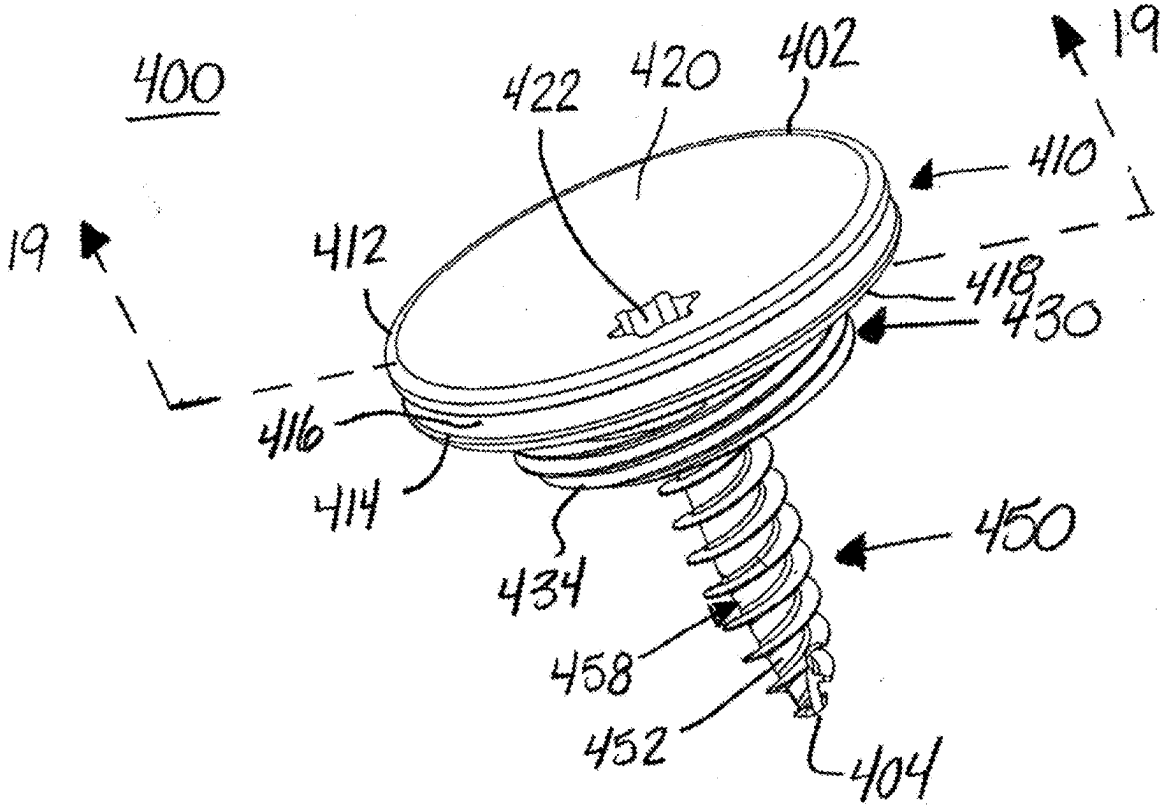
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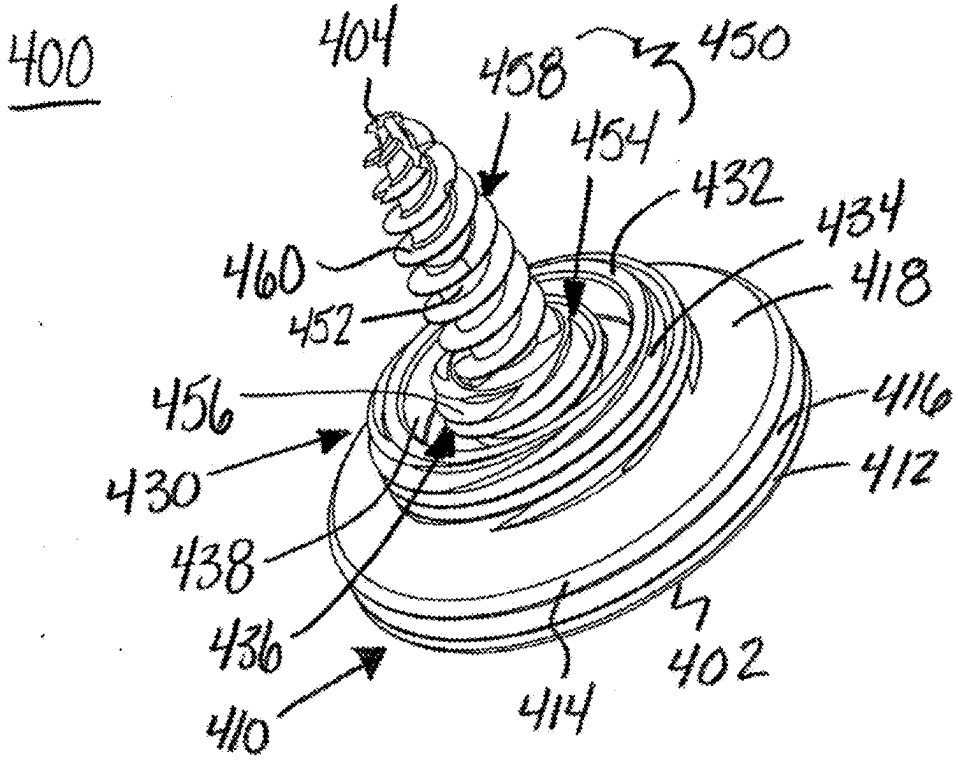
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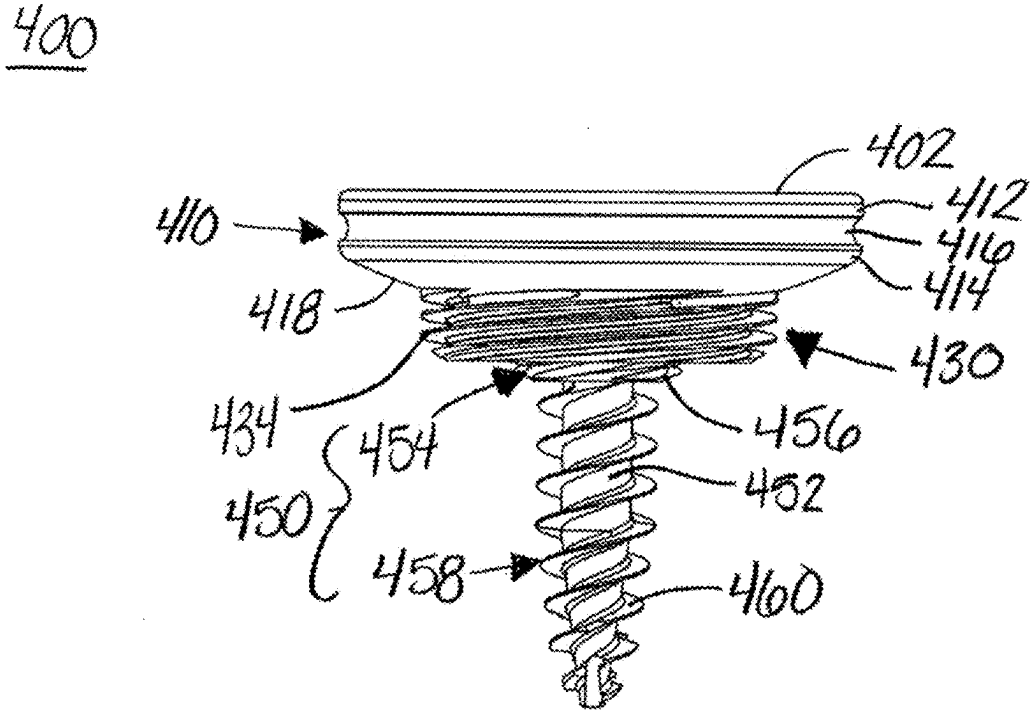
FIG. 17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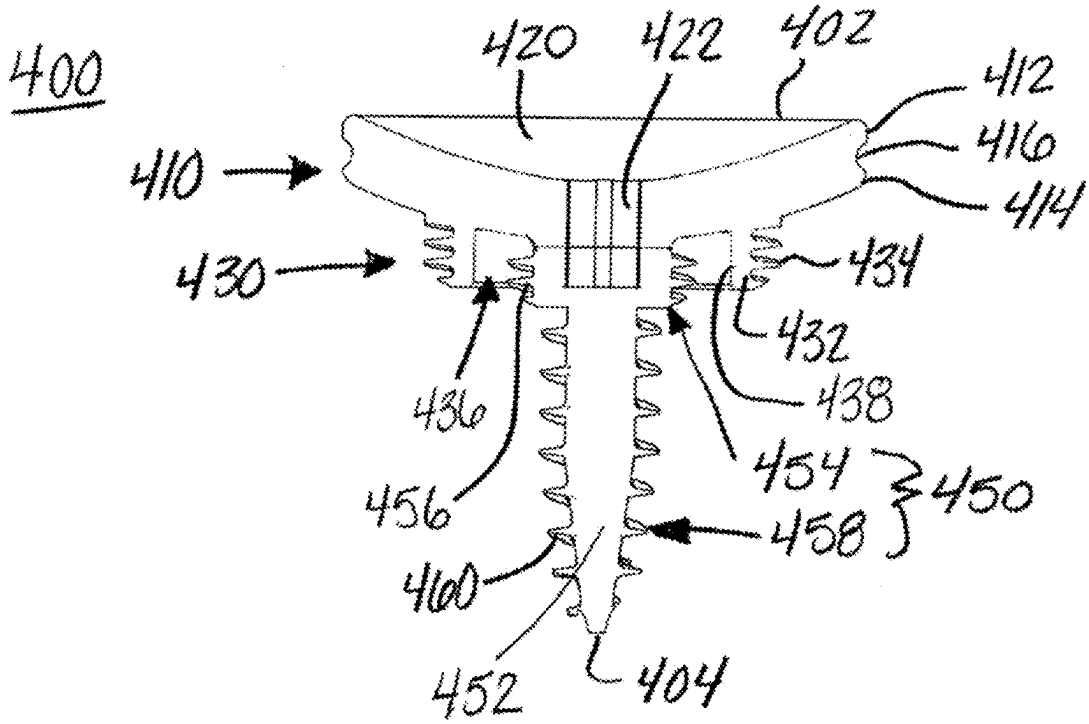
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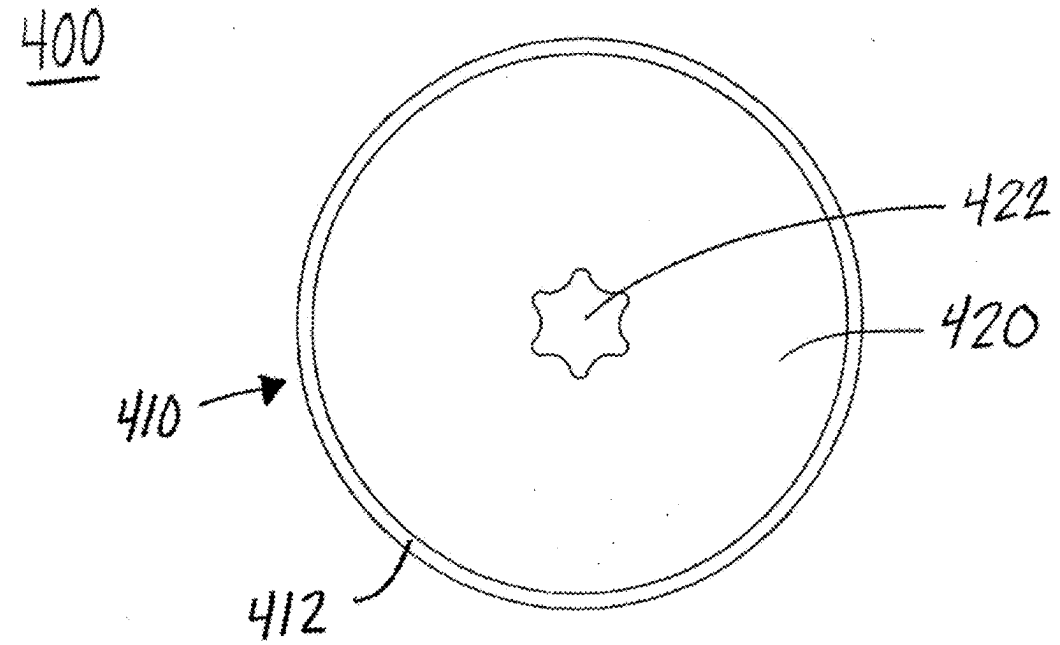
FIG. 19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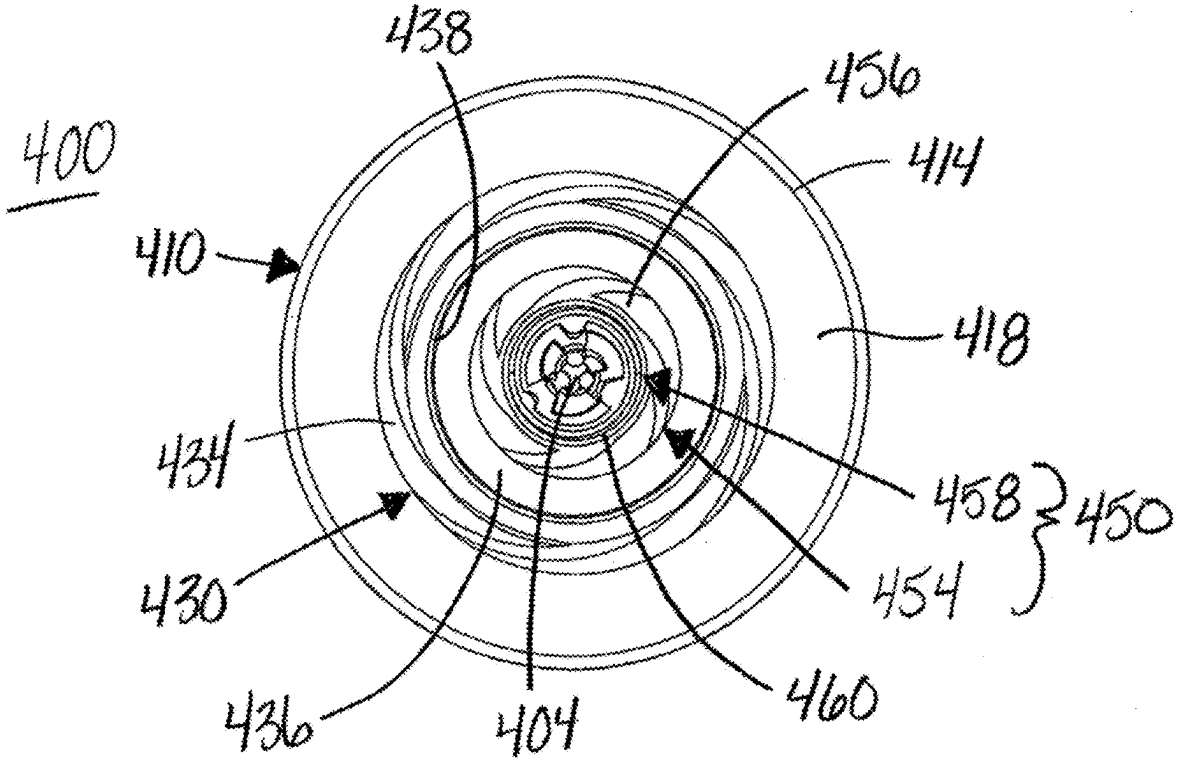
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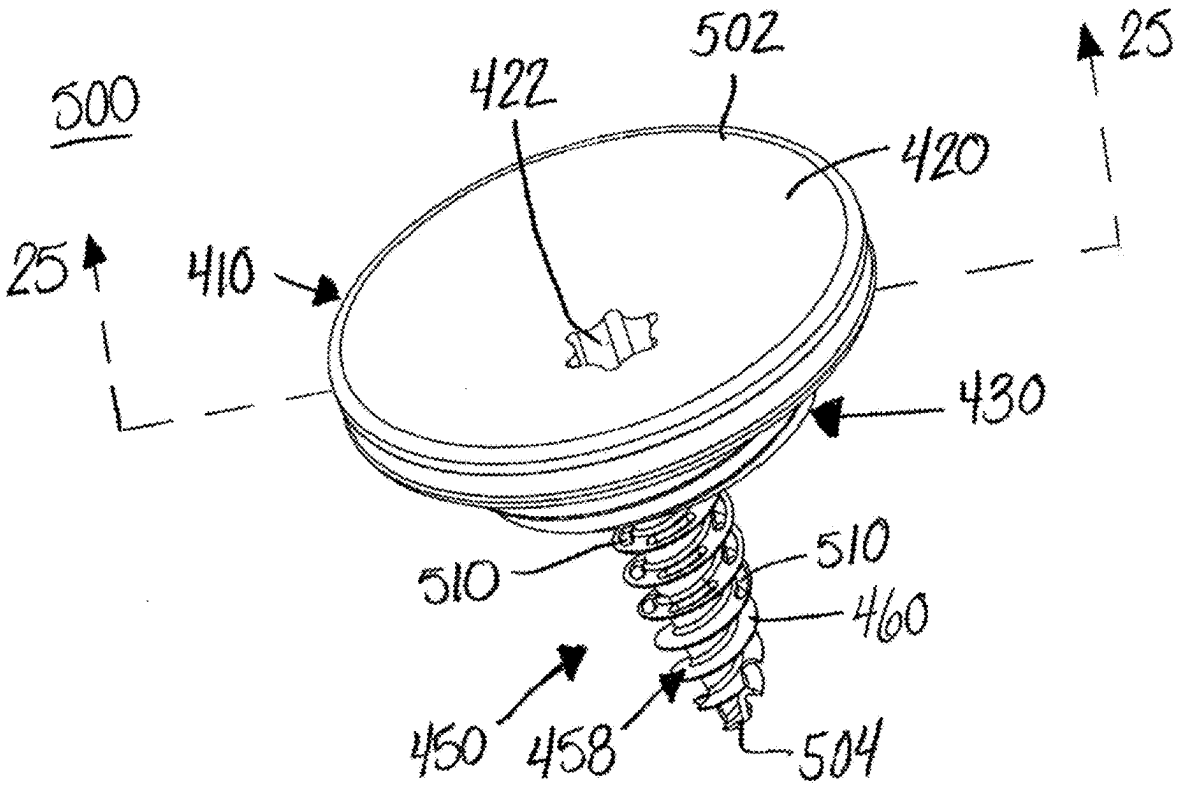
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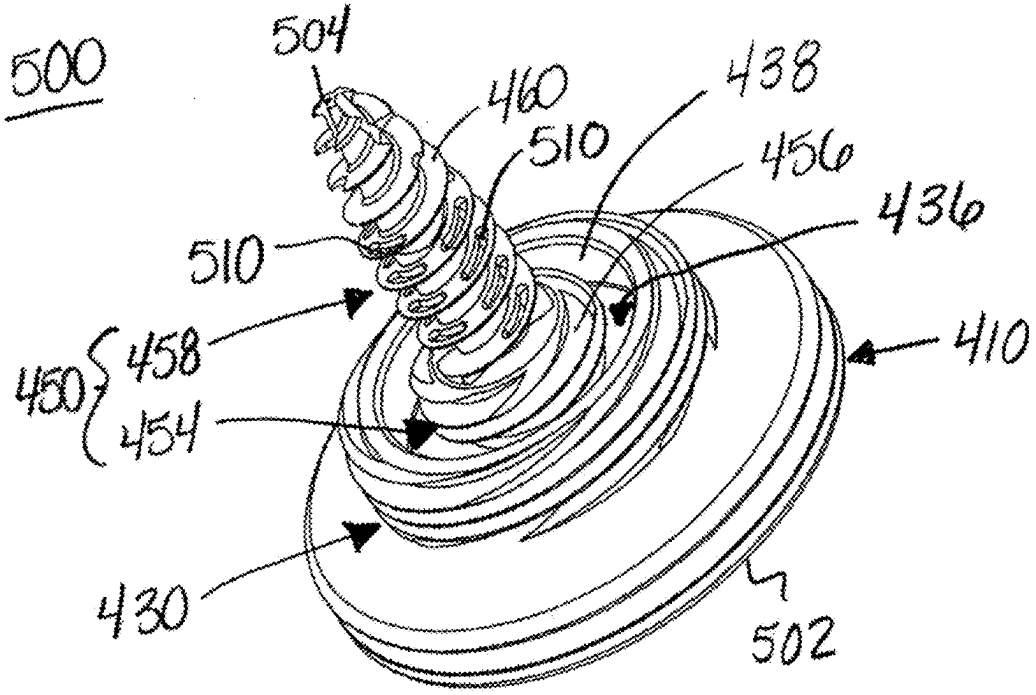
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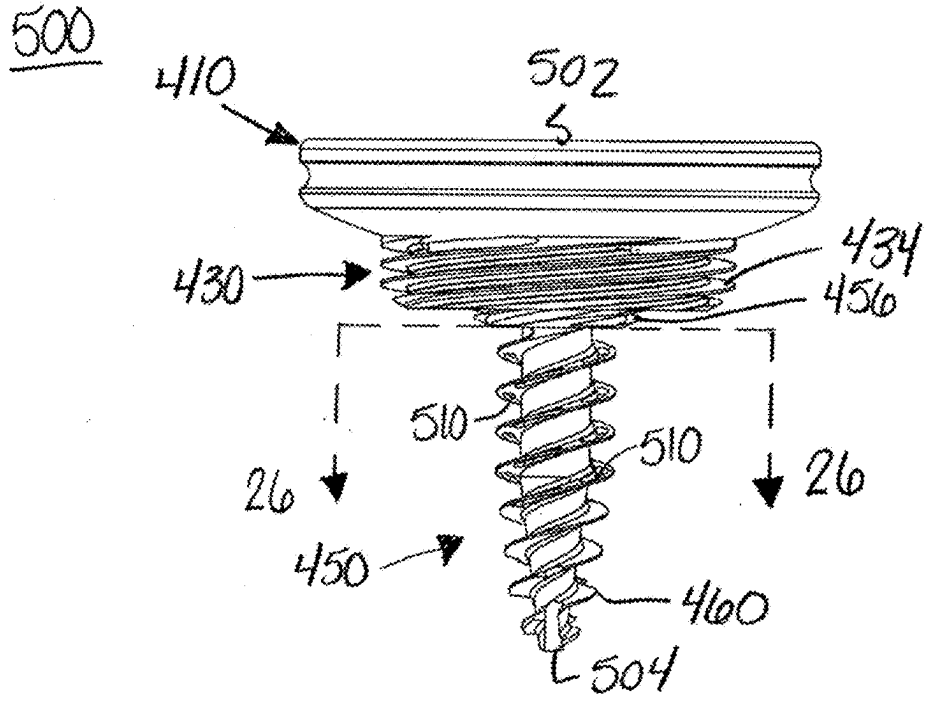

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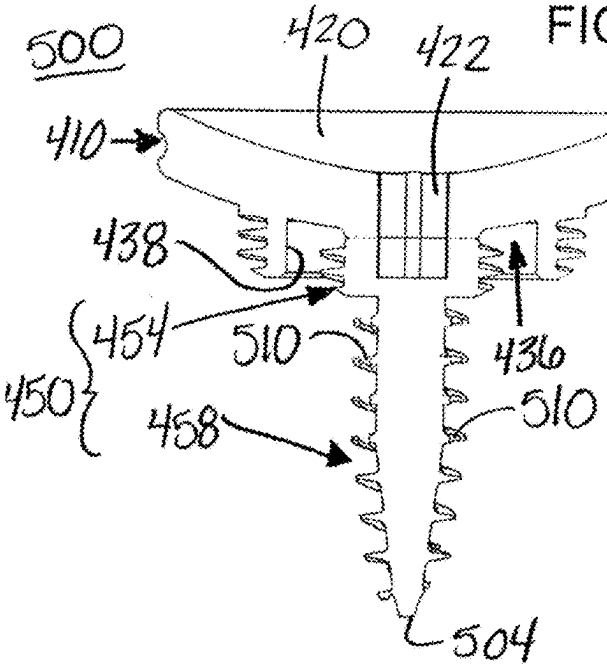

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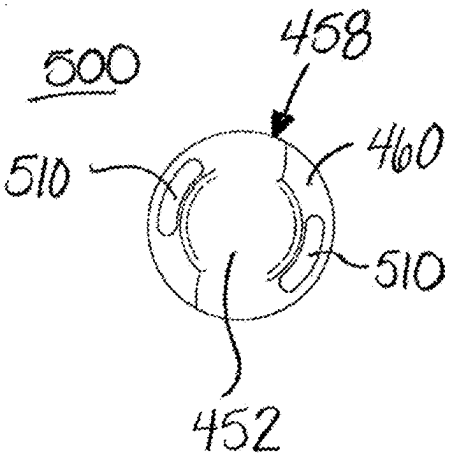

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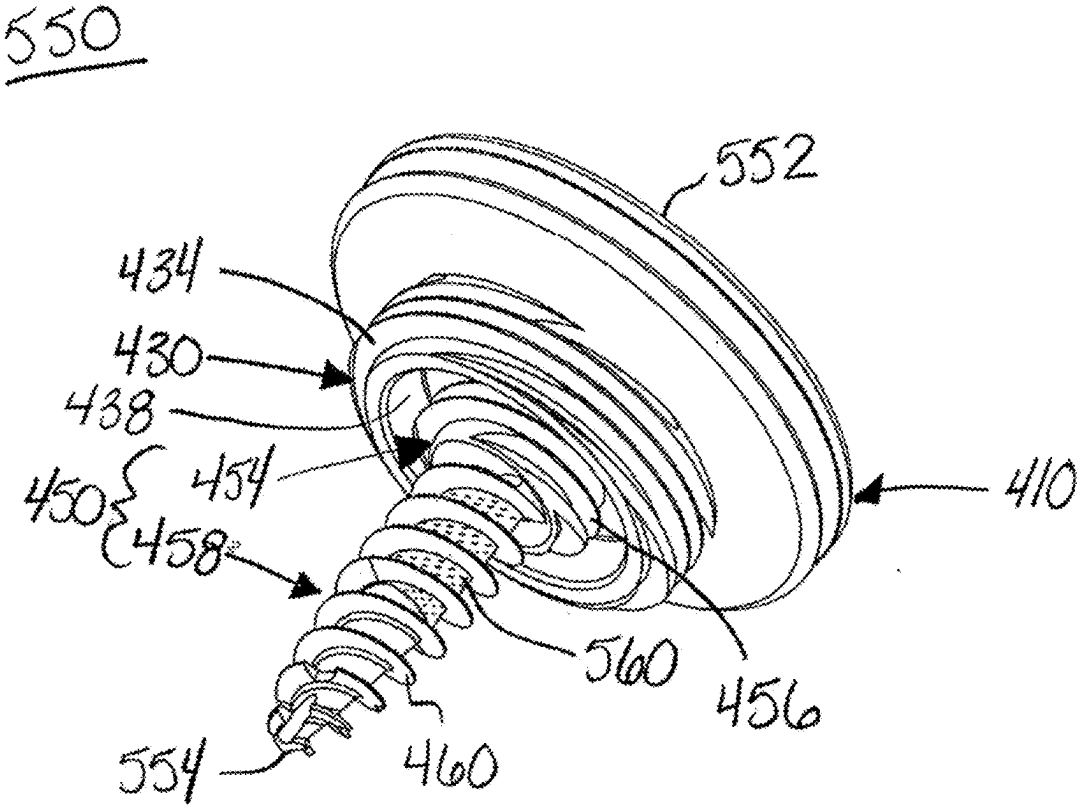
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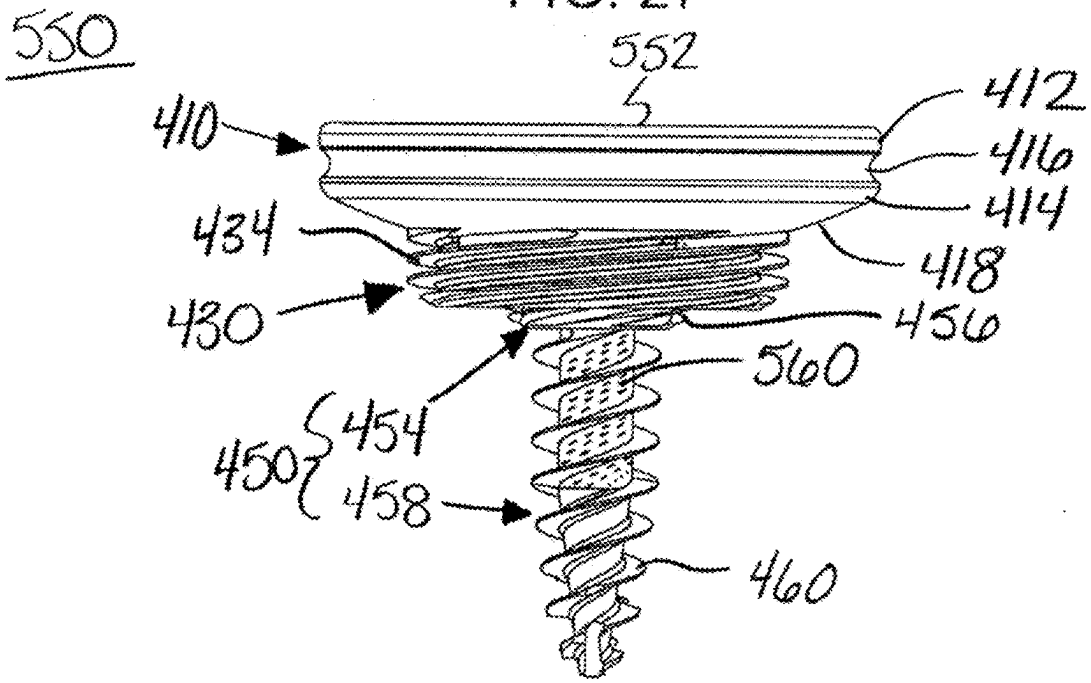
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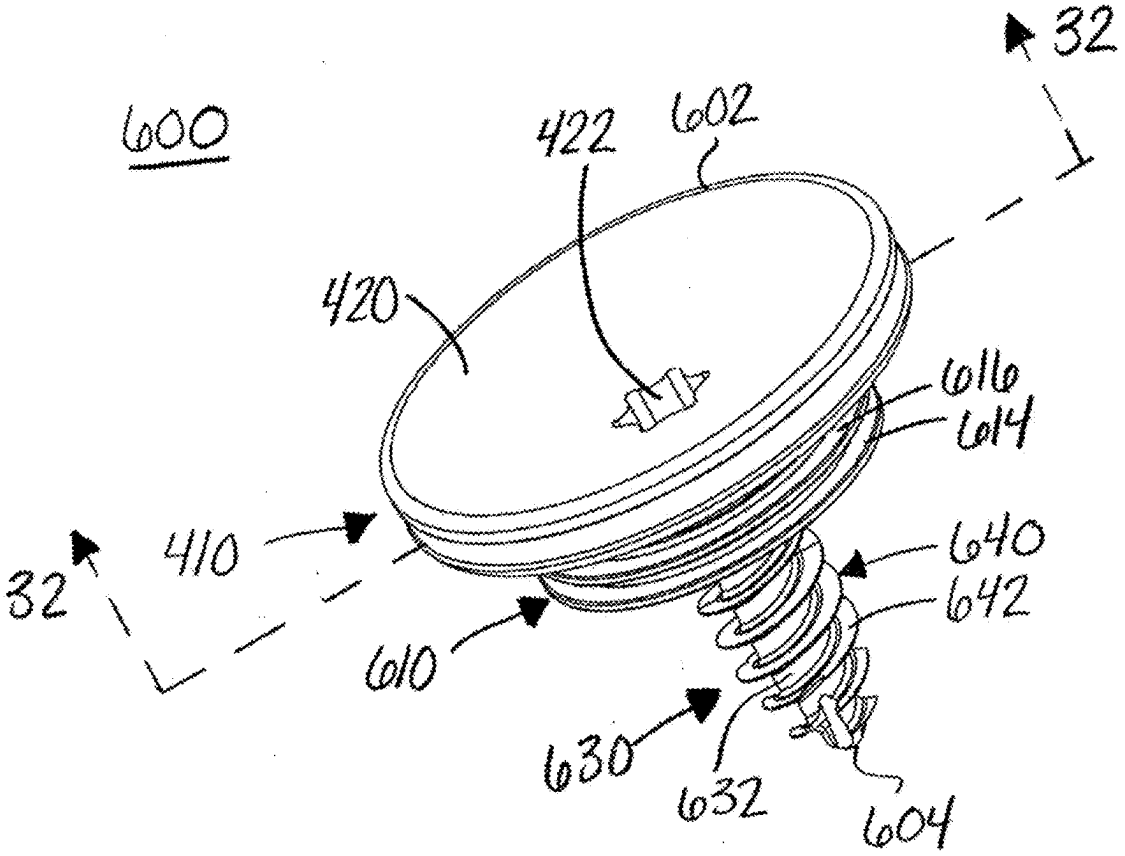
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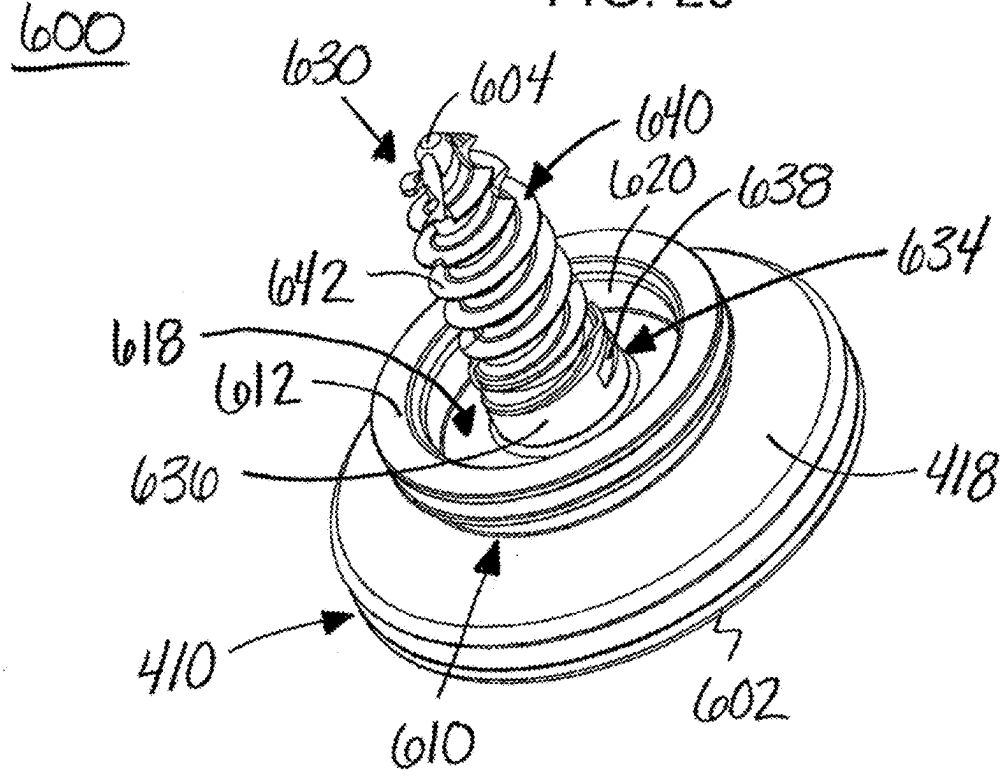
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FIG. 30

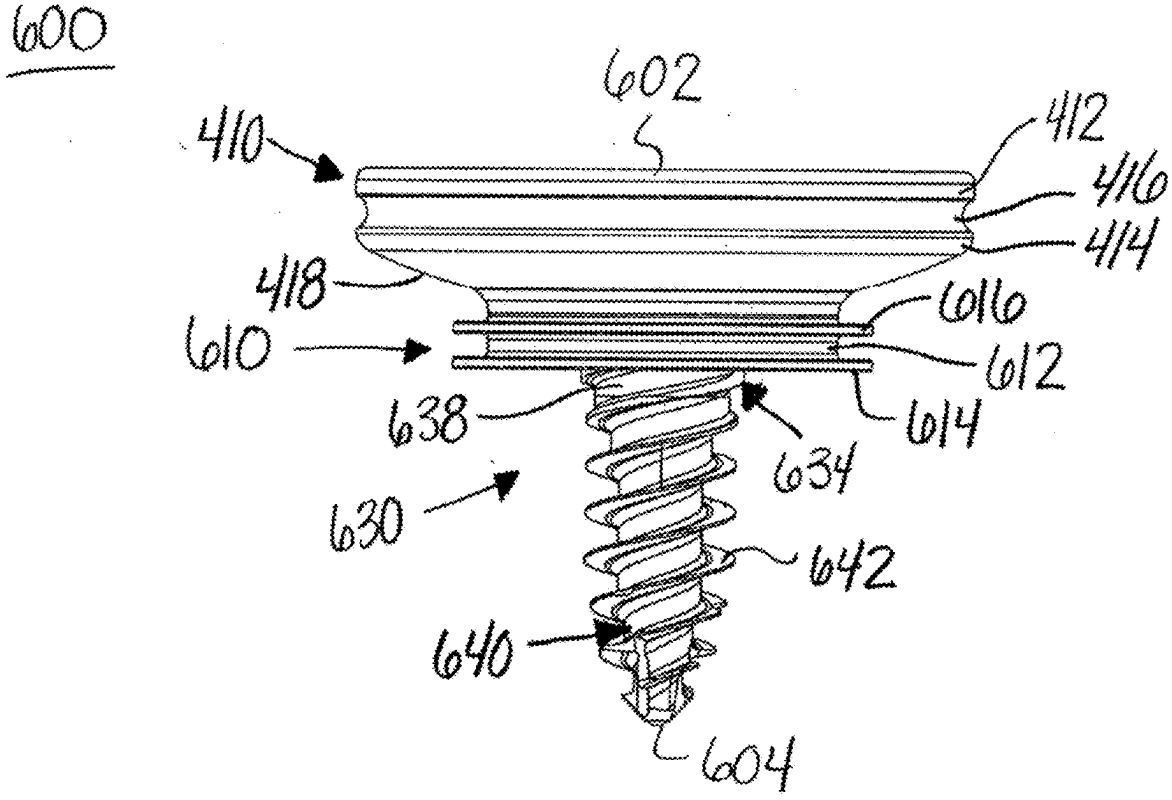
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FIG. 31

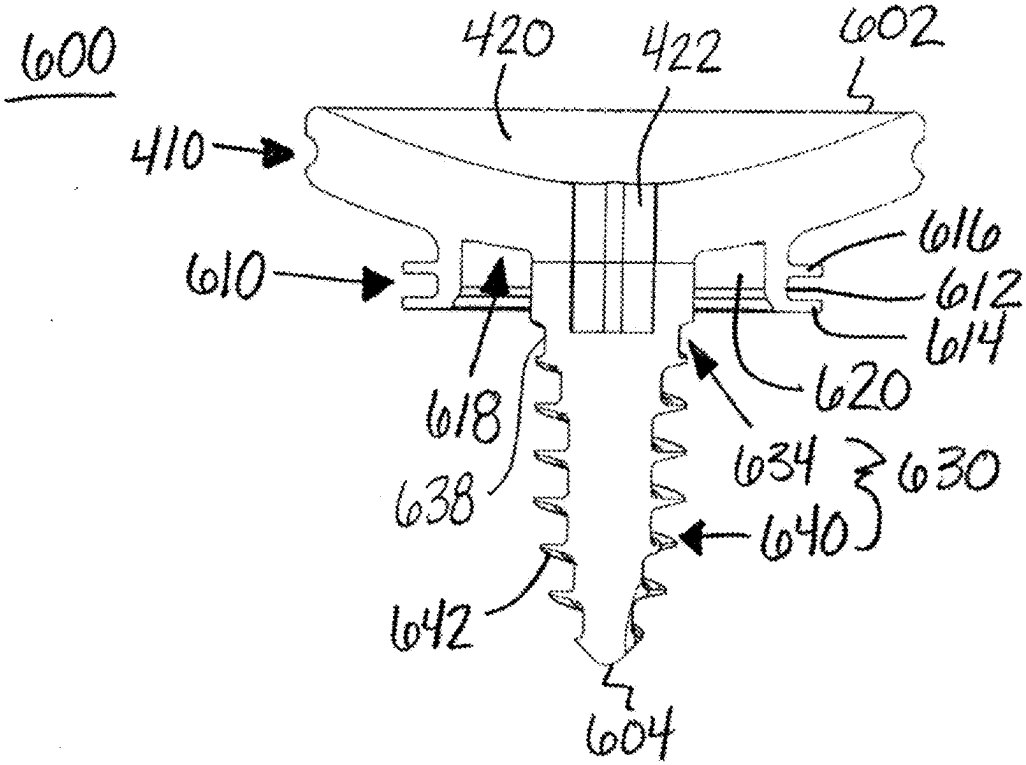
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FIG. 32

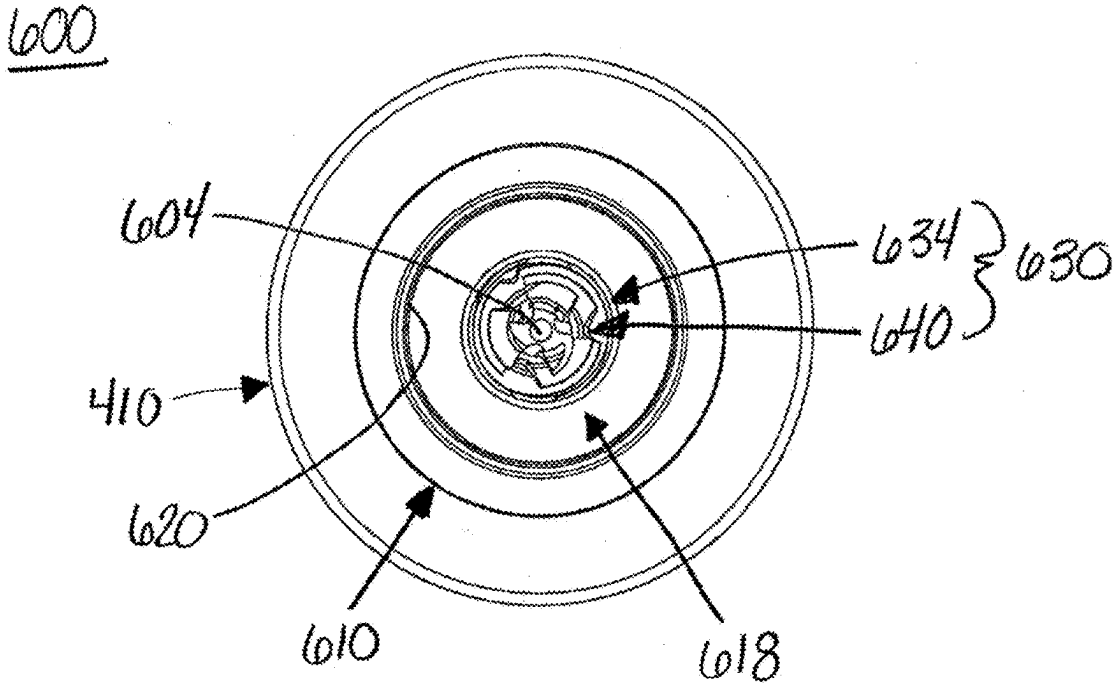
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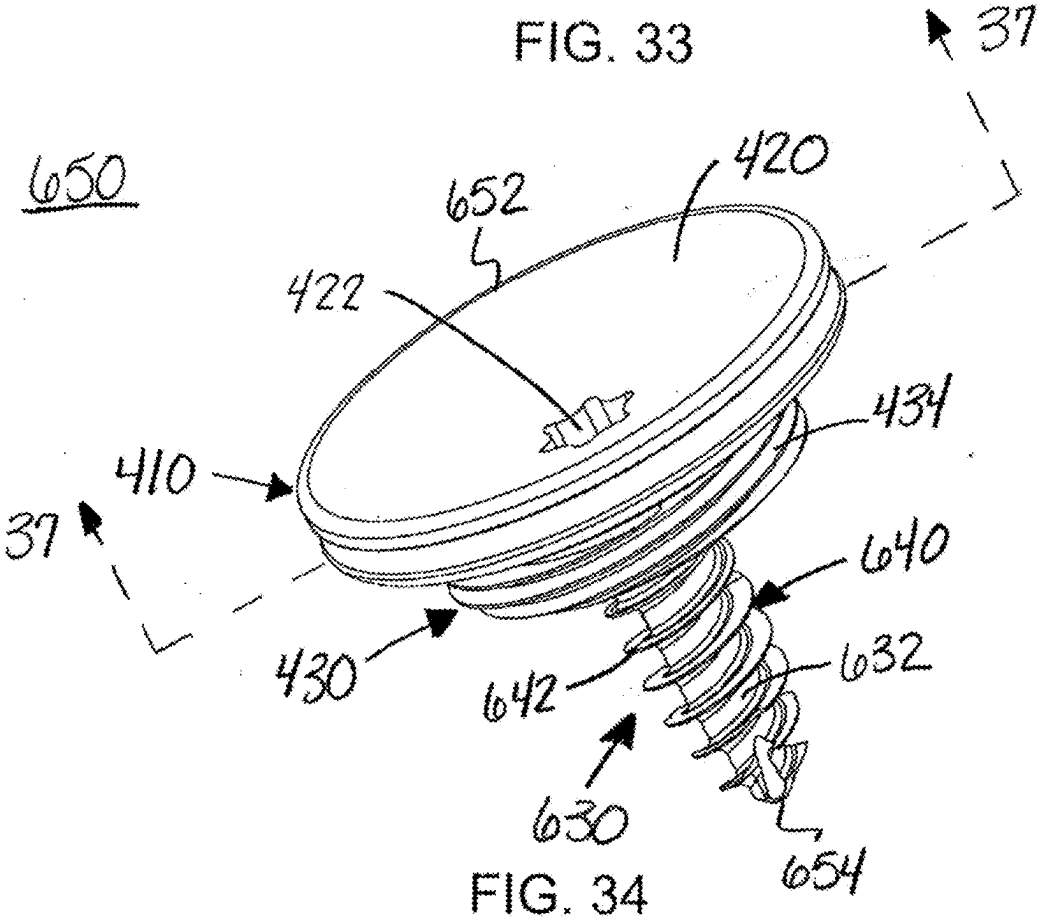
FIG. 33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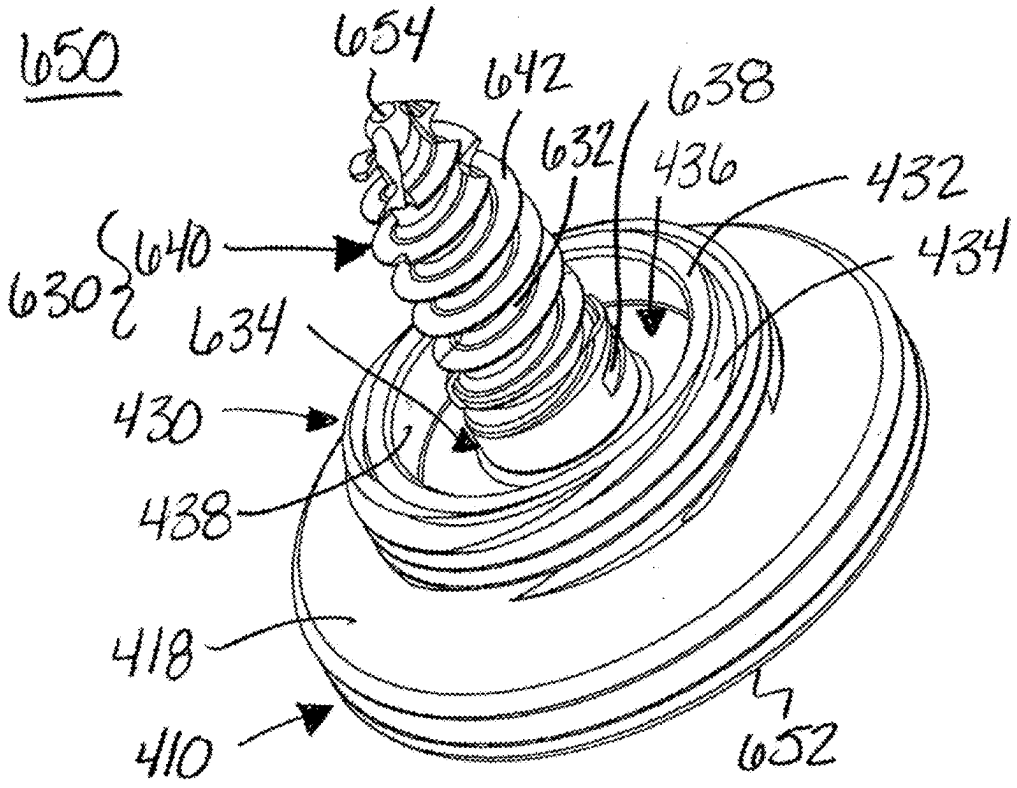
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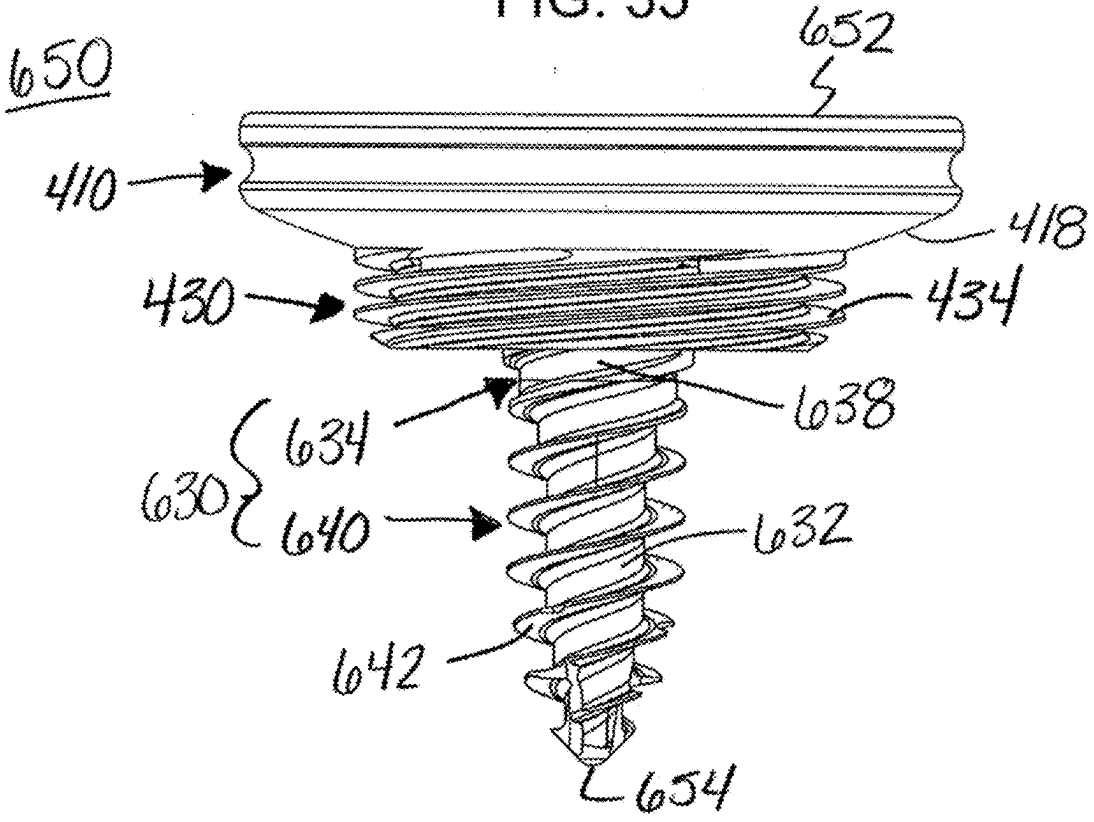
FIG. 35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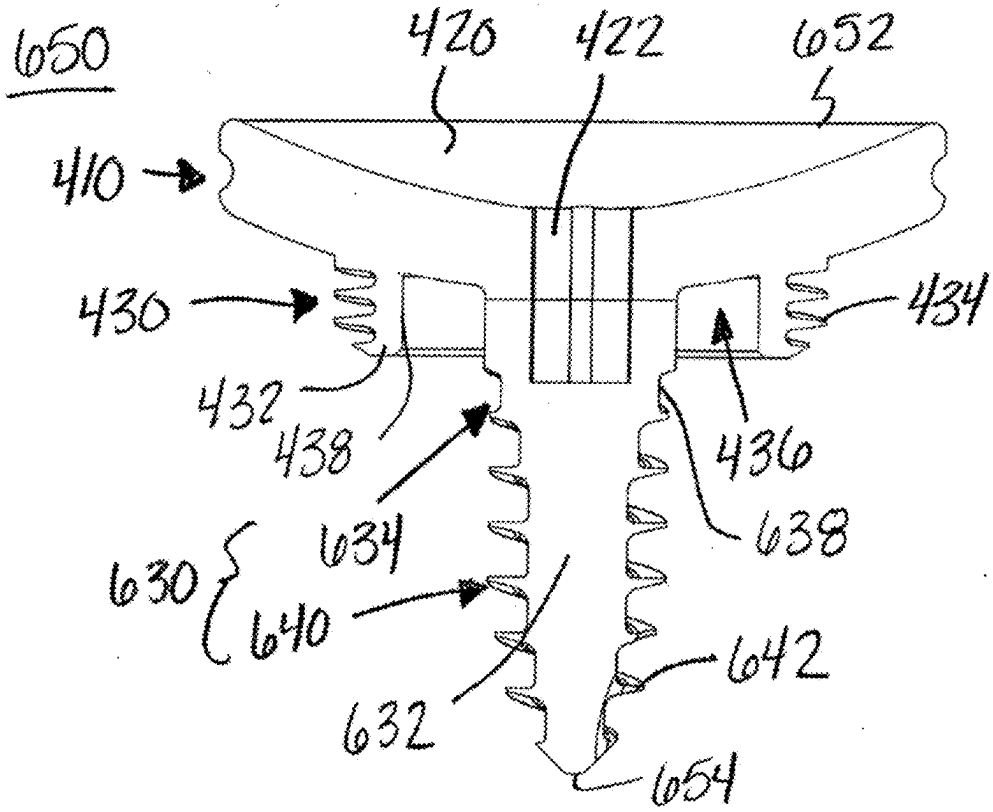
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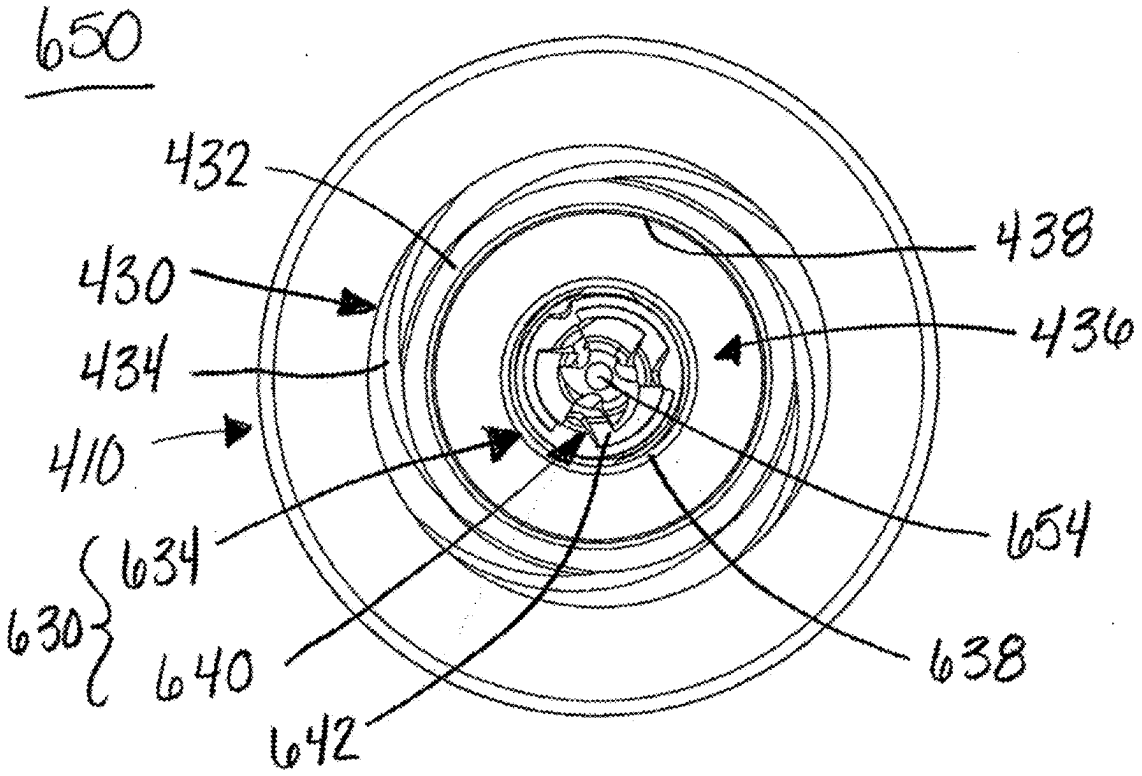
FIG. 37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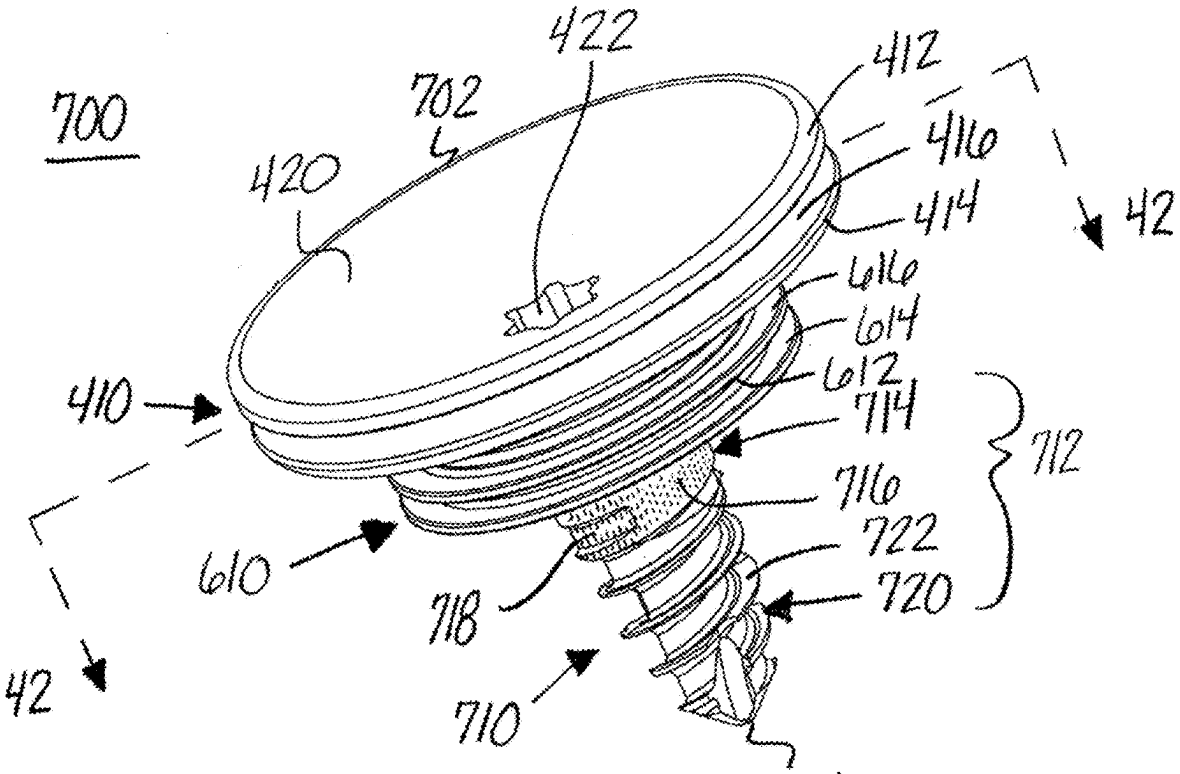
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FIG. 39

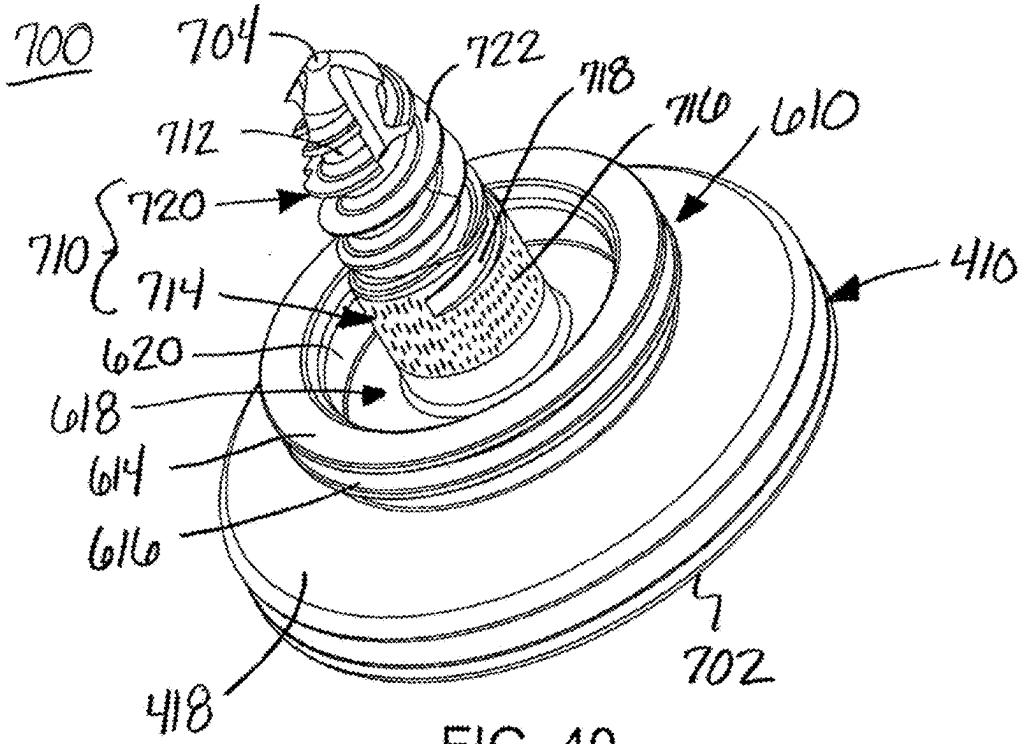
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FIG. 40

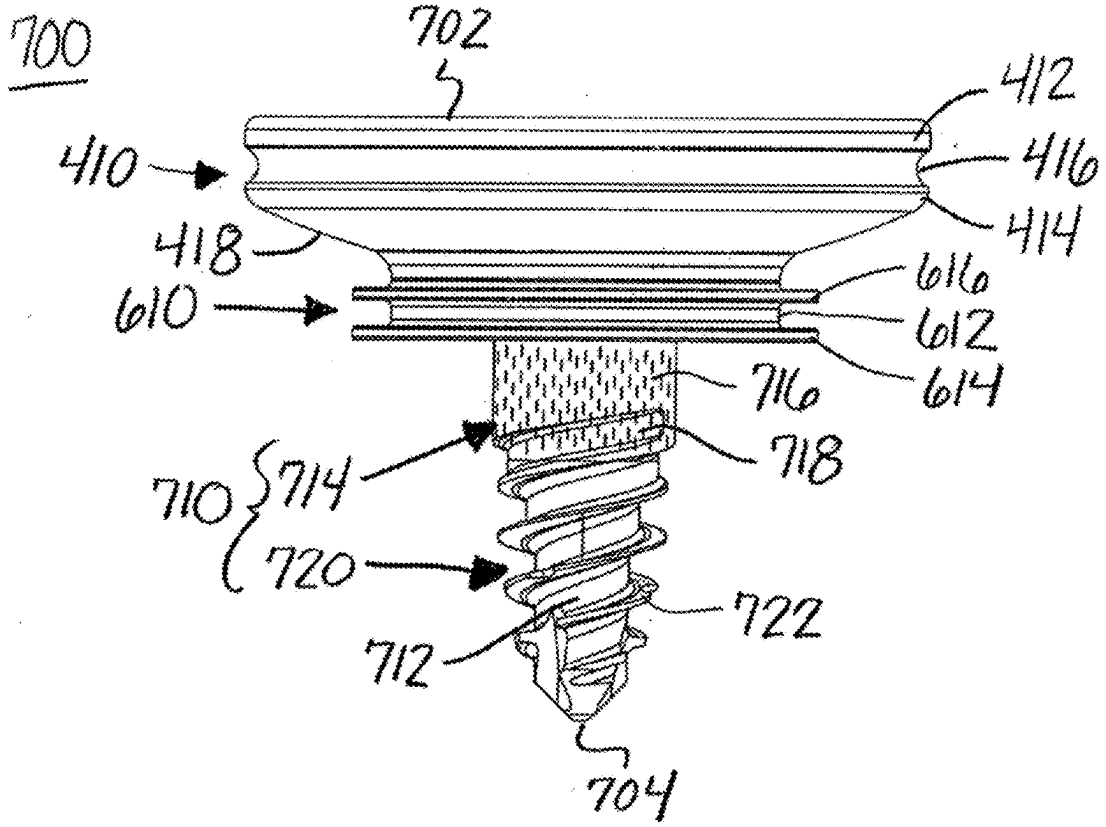
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FIG. 41

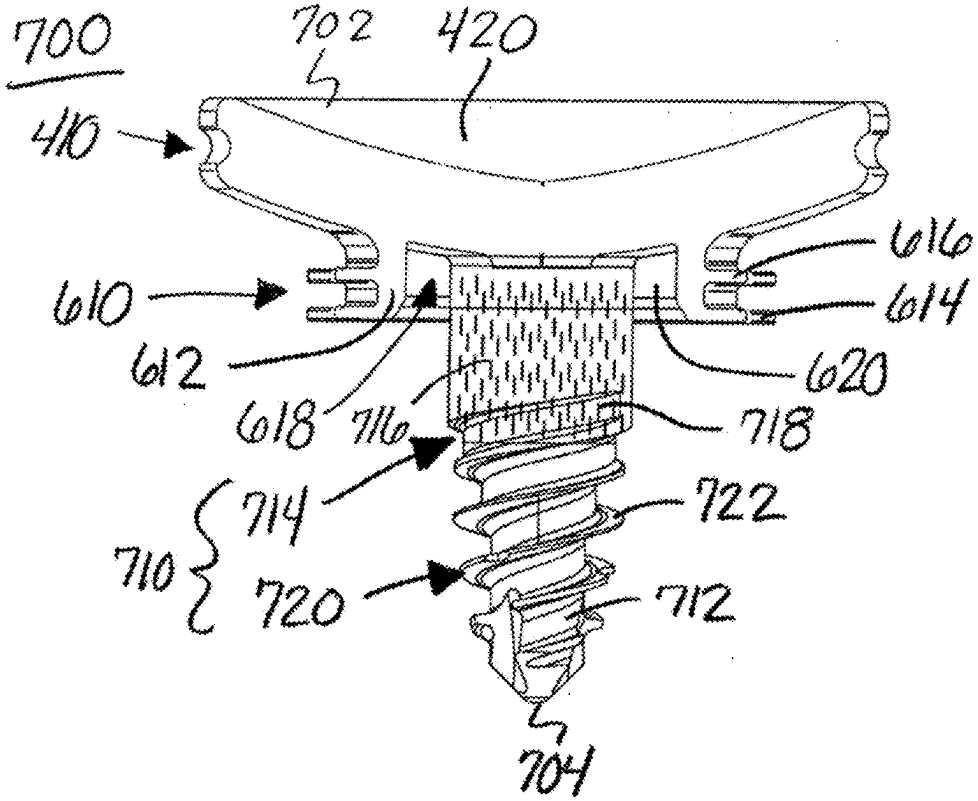
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FIG. 42

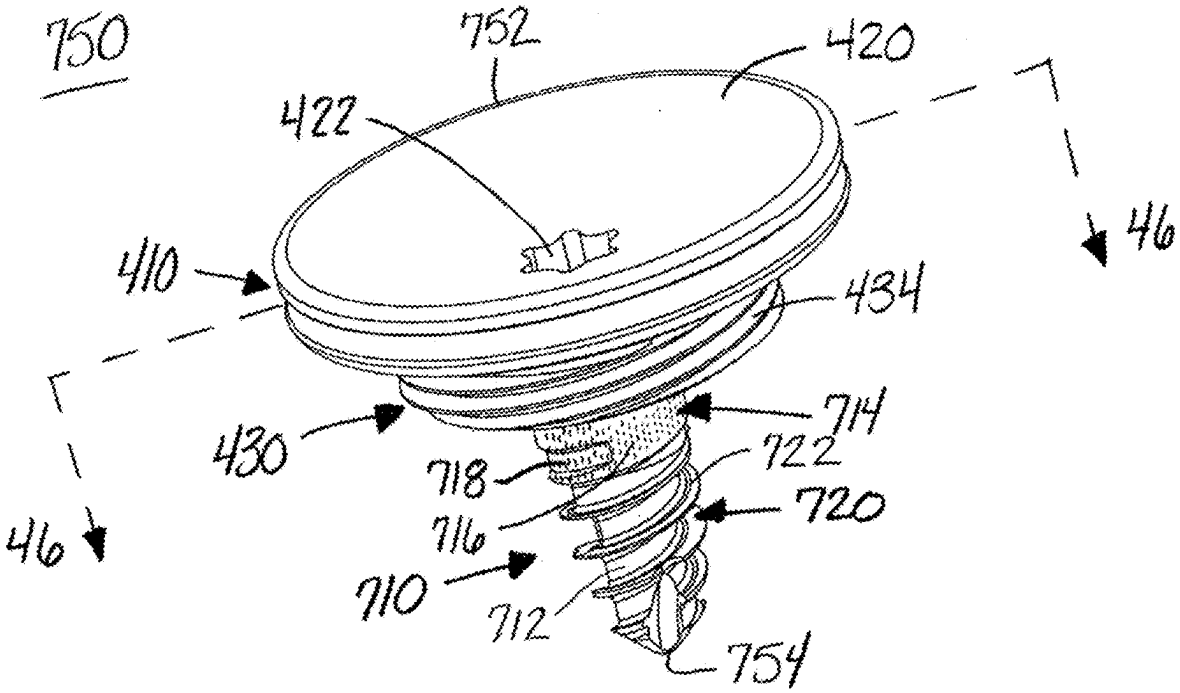
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FIG. 43

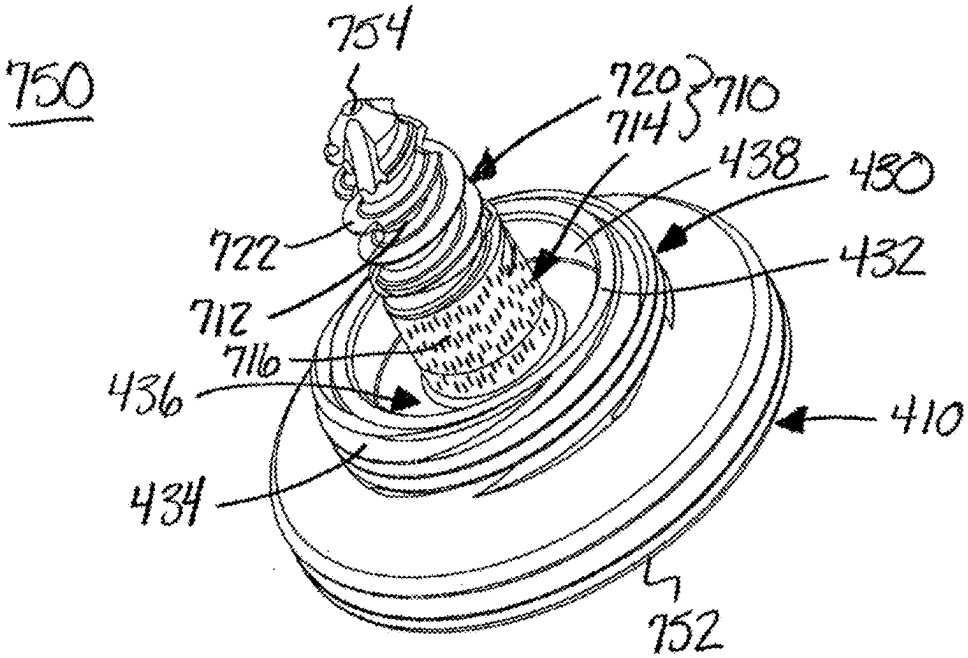
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FIG. 44

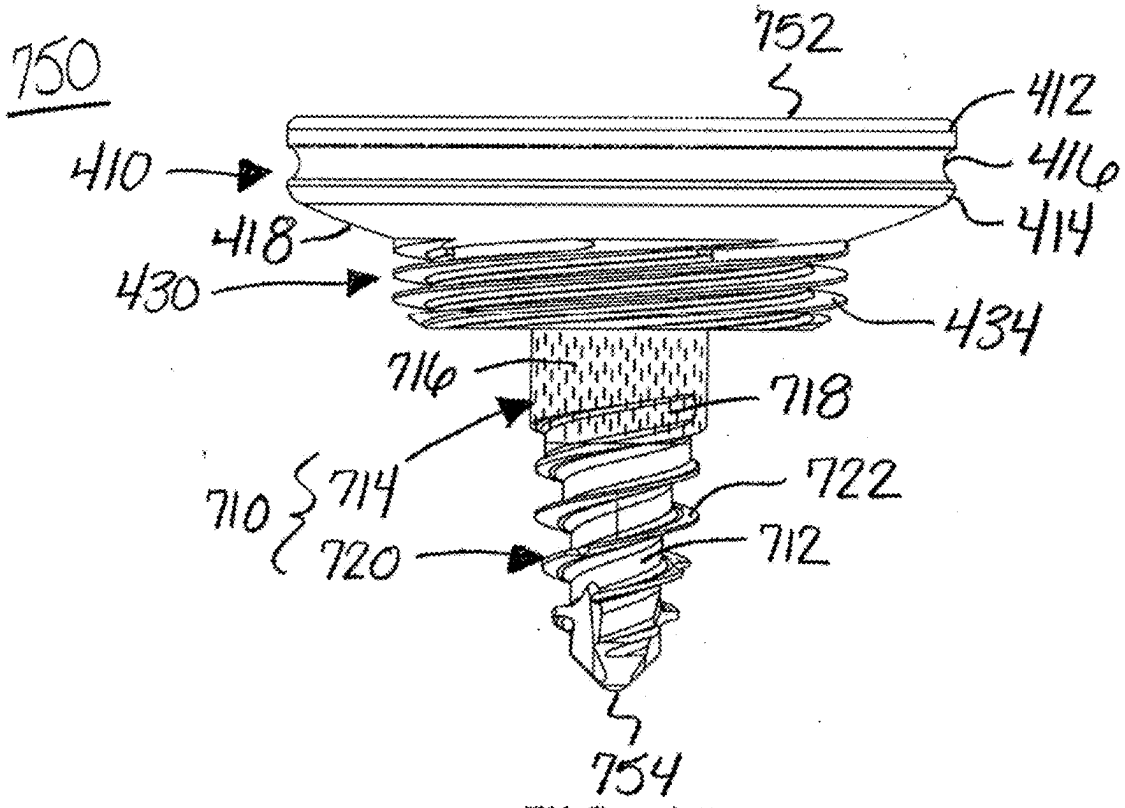
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FIG. 45

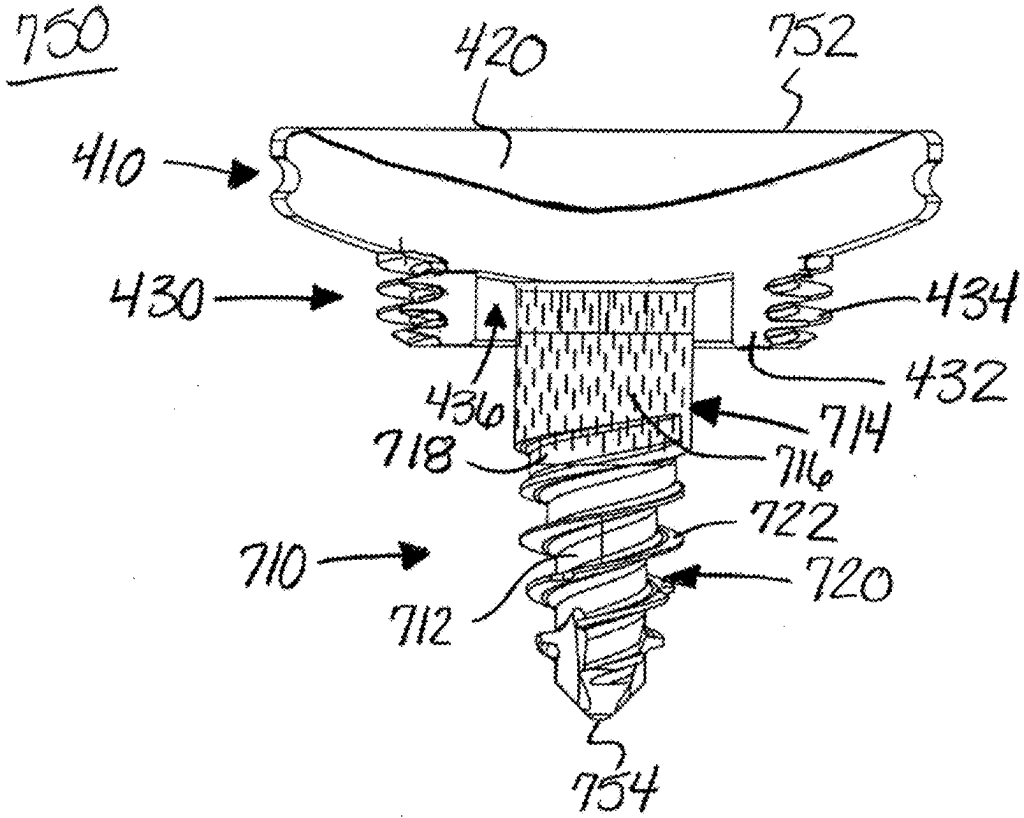
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FIG. 46

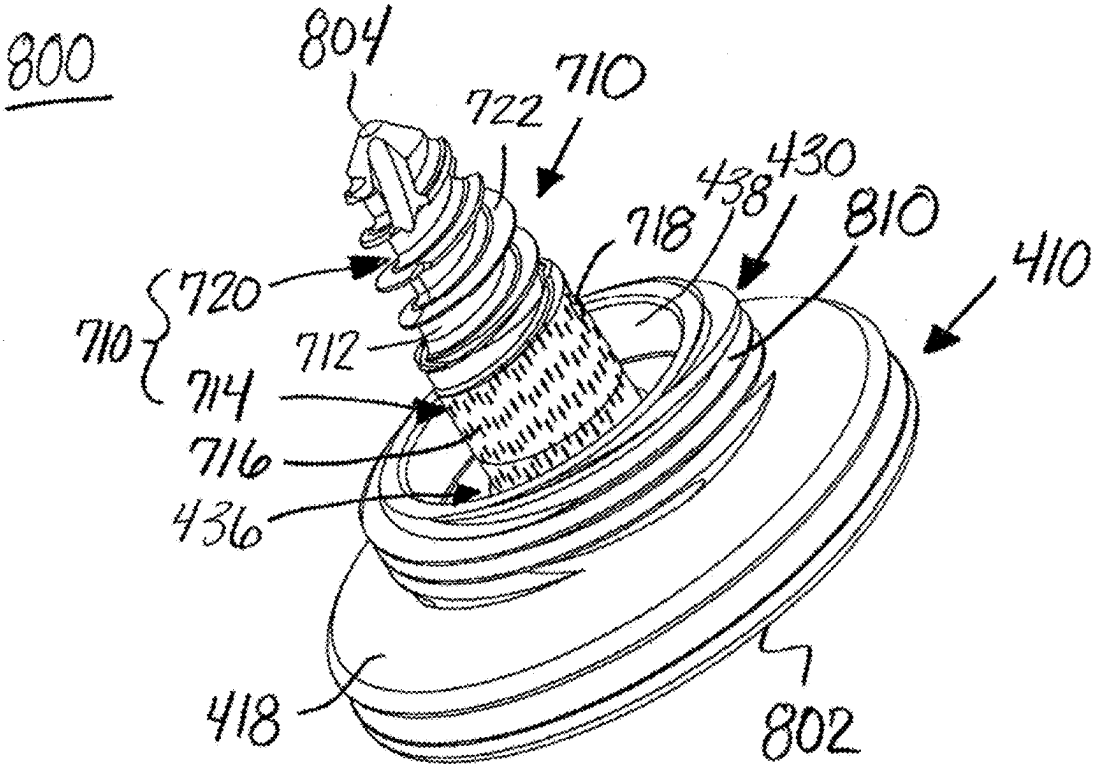
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FIG. 47

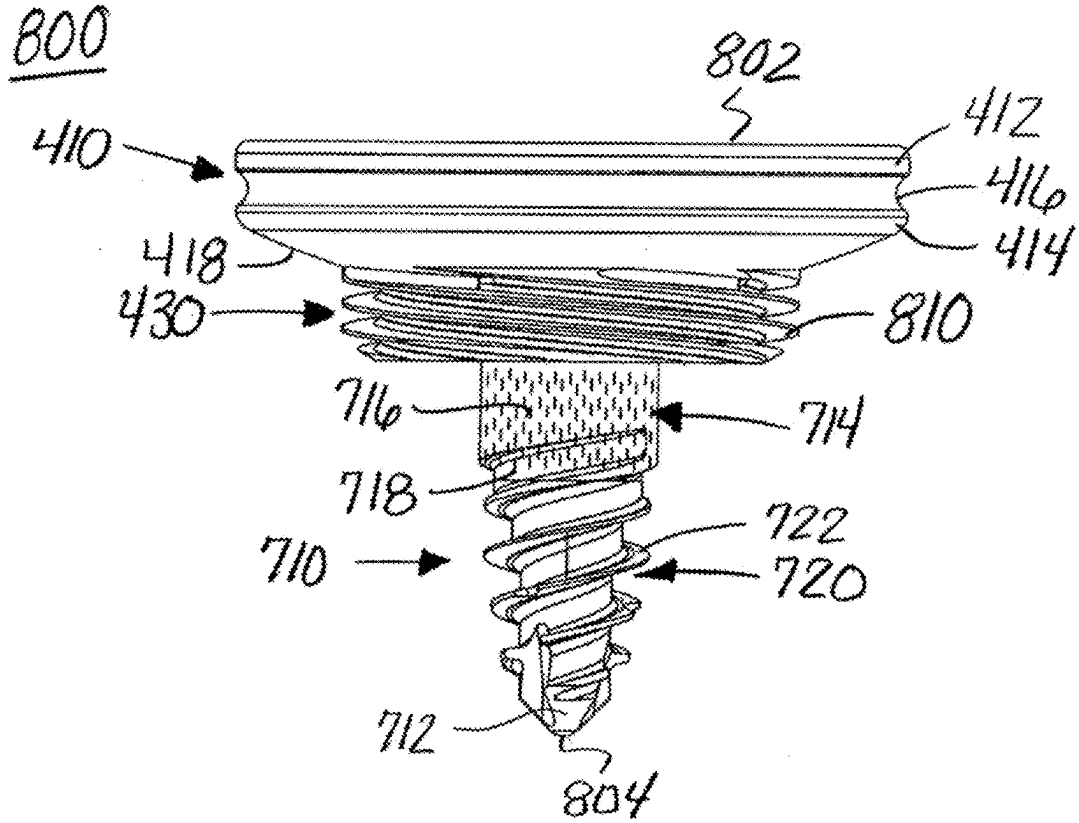
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FIG. 48

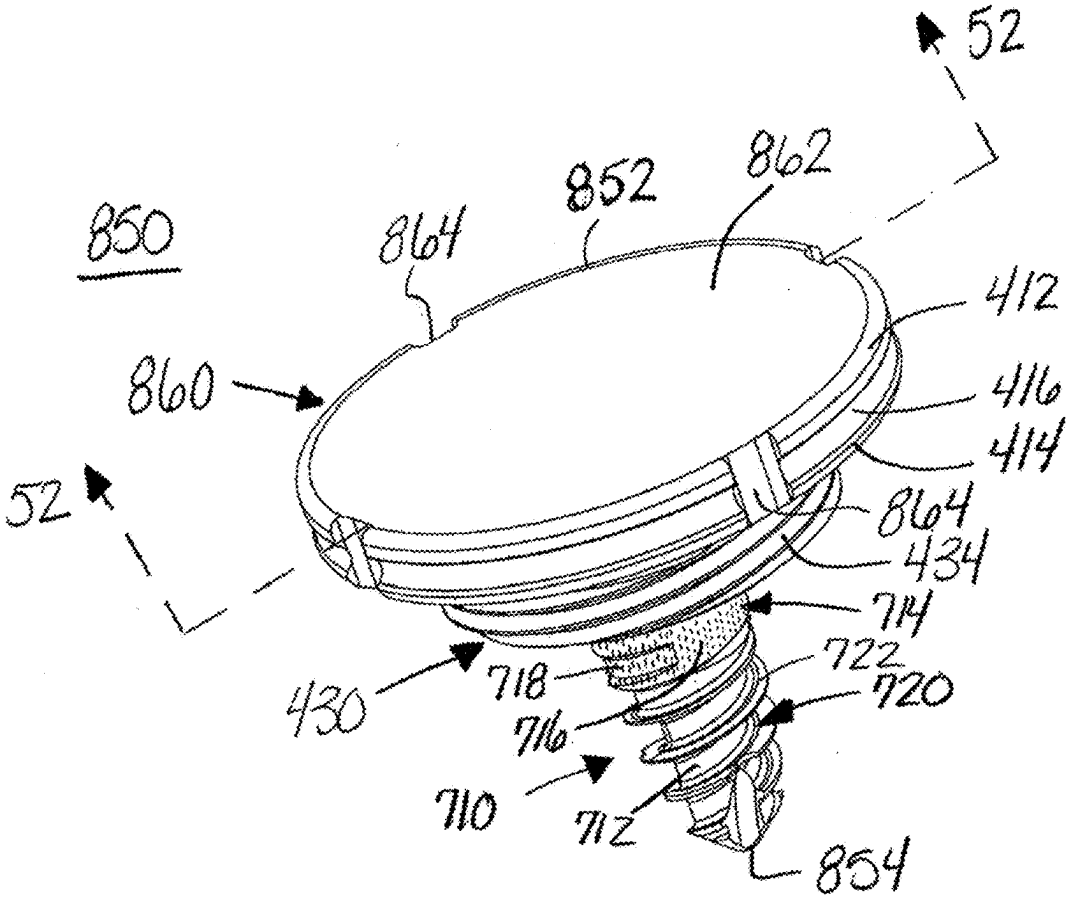
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FIG. 49

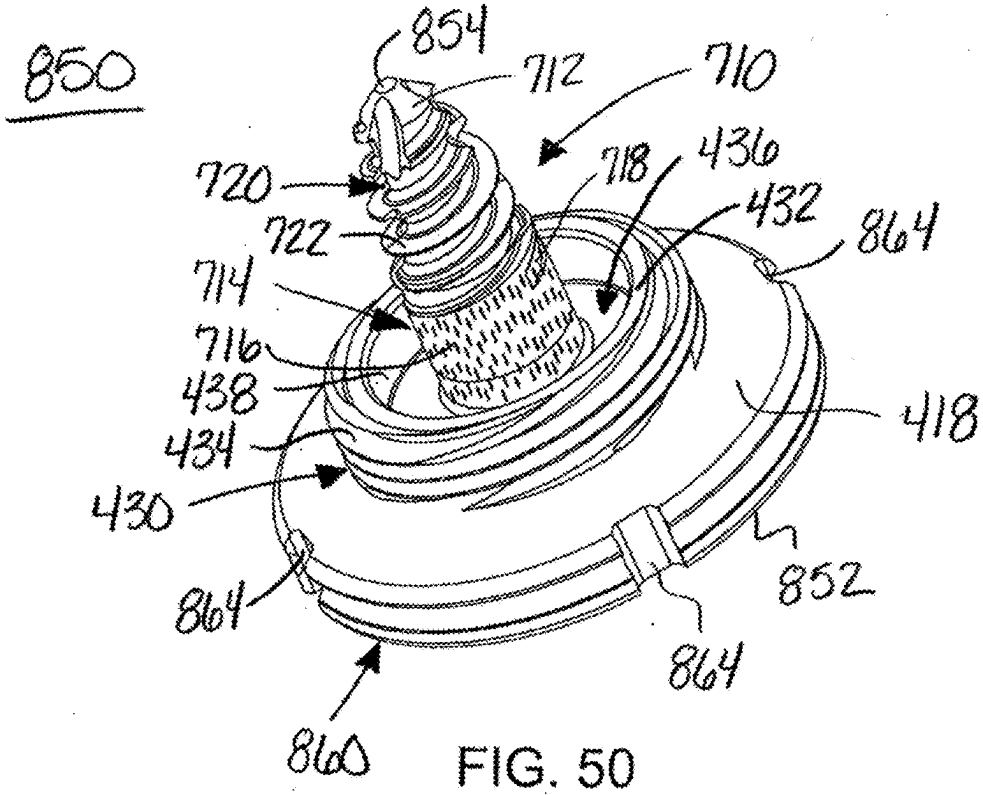
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FIG. 50

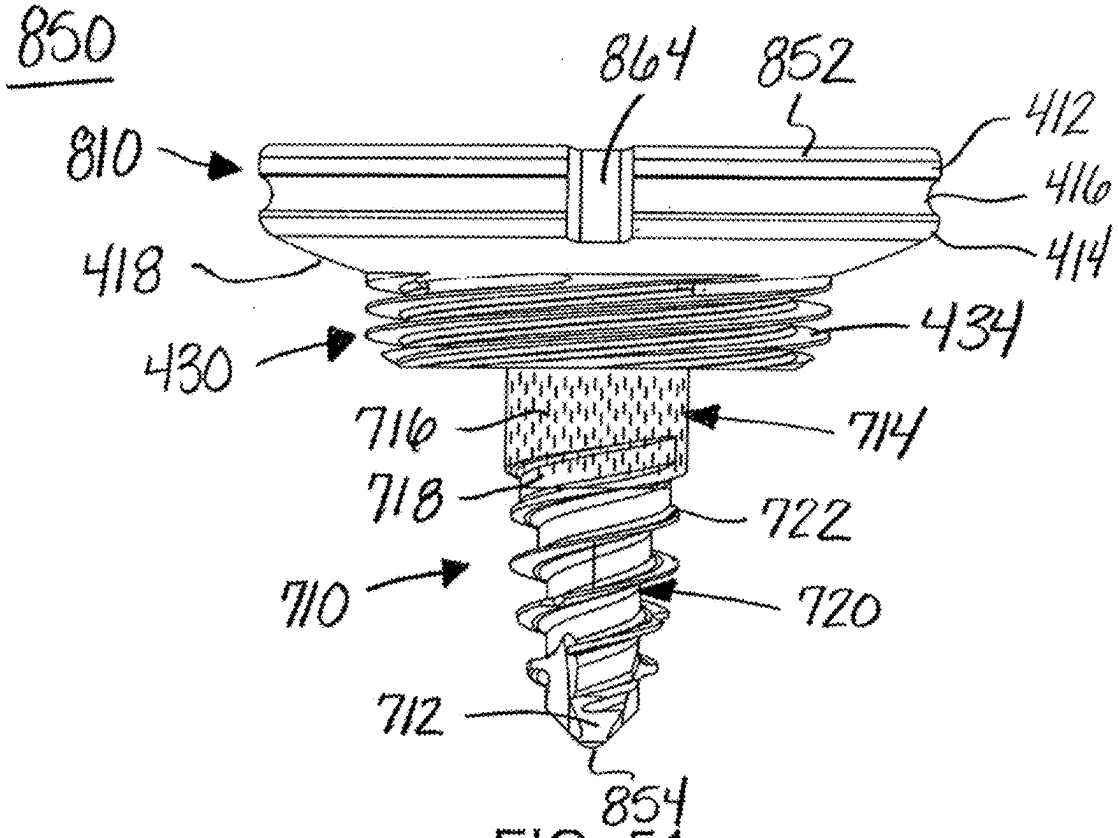
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FIG. 51

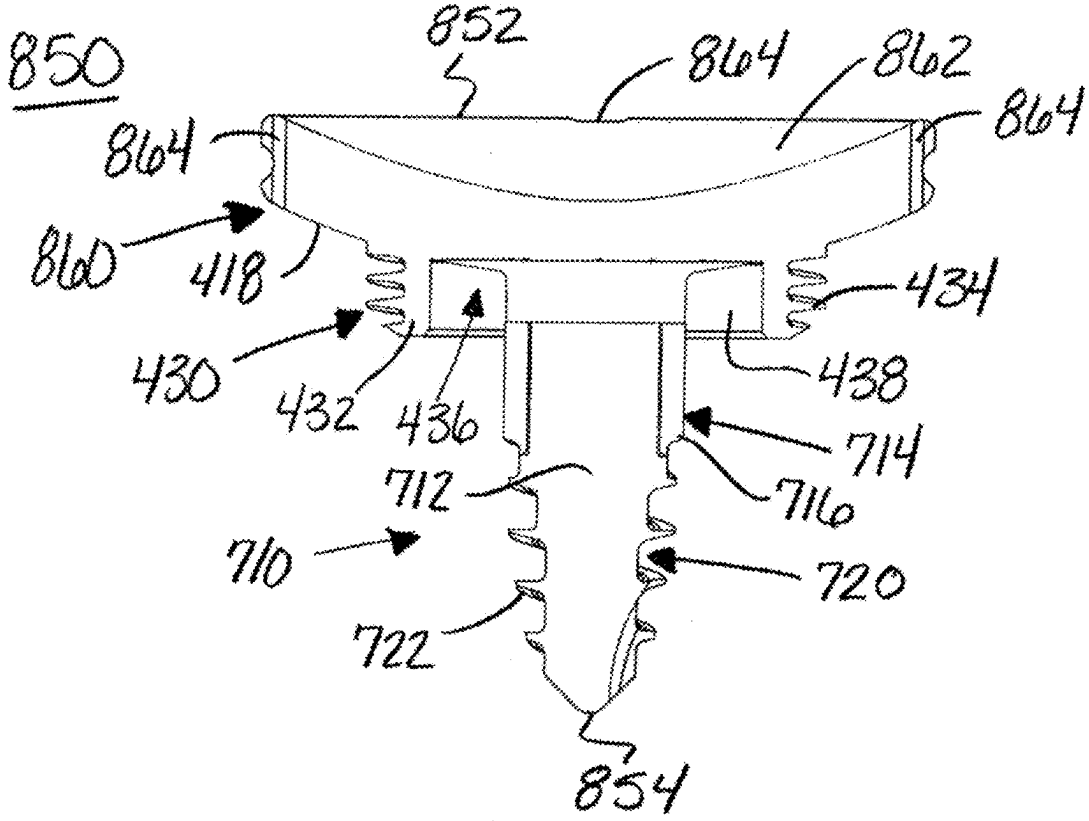
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FIG. 52

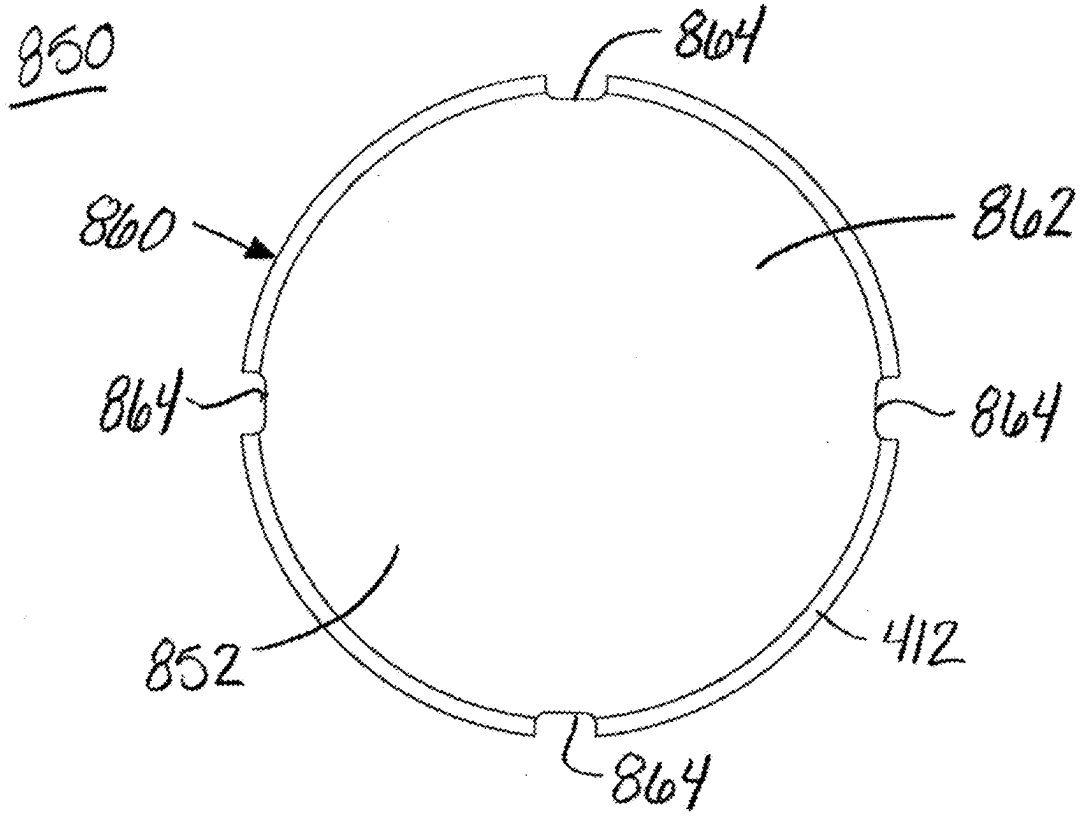
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FIG. 53

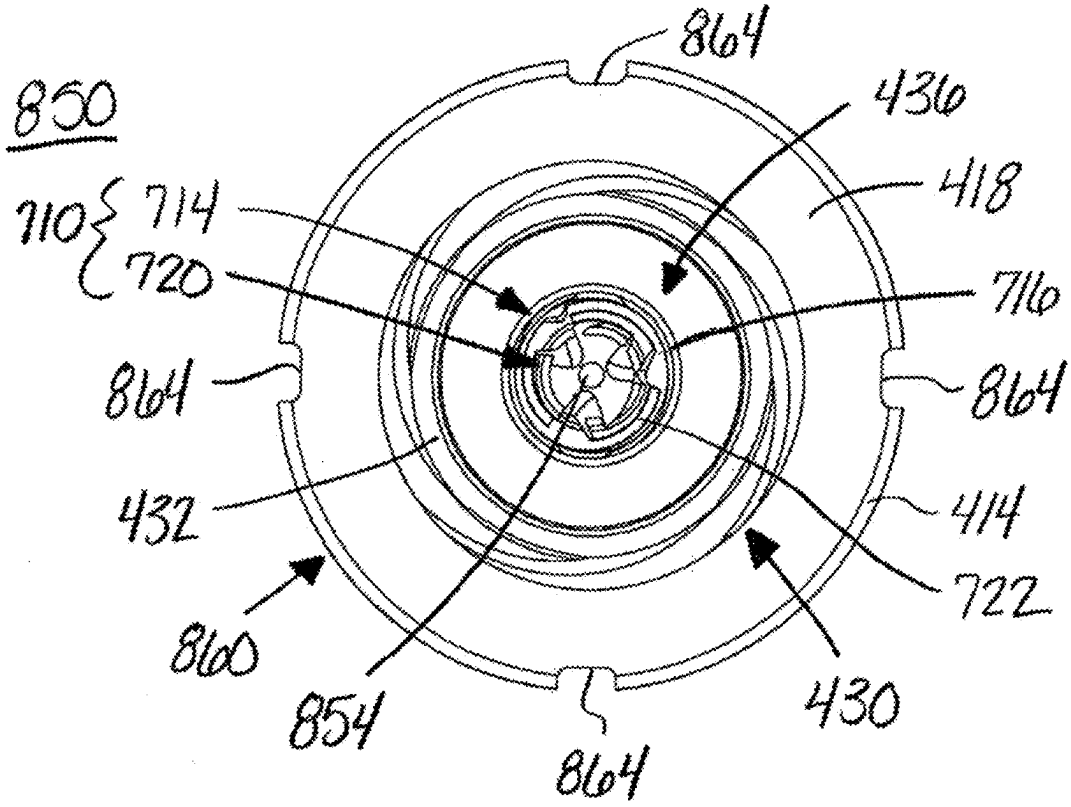
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FIG. 54

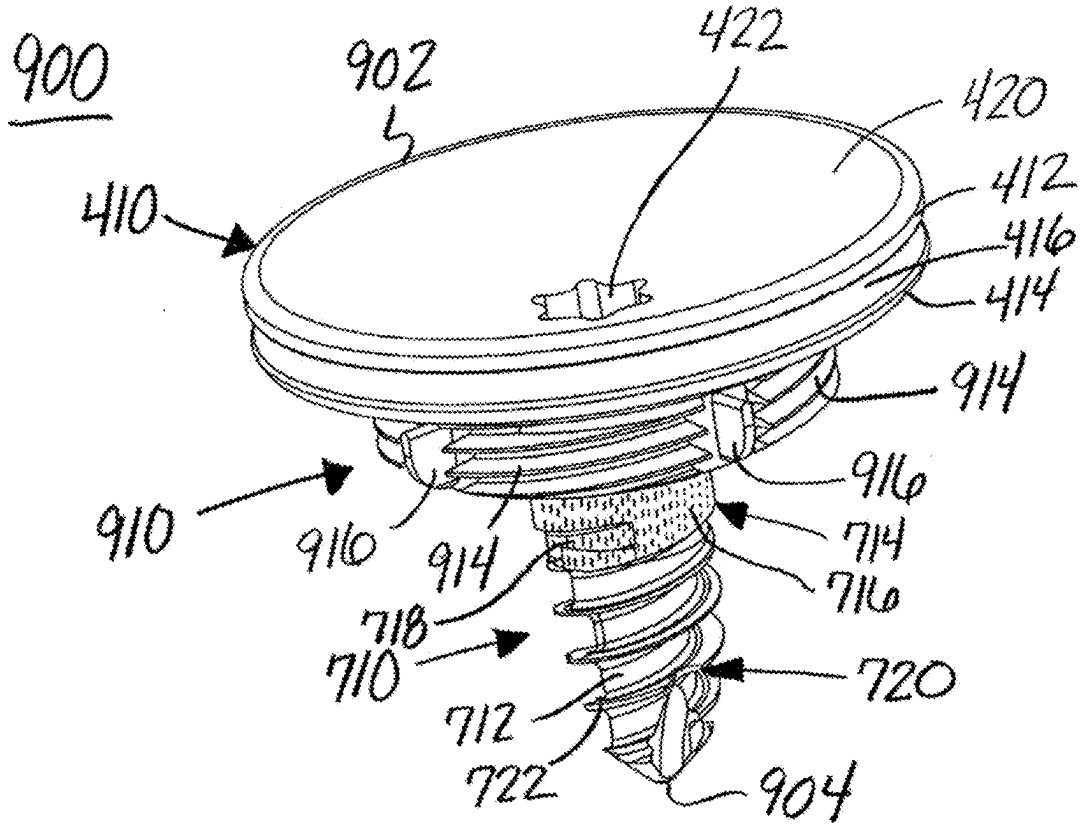
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FIG. 55

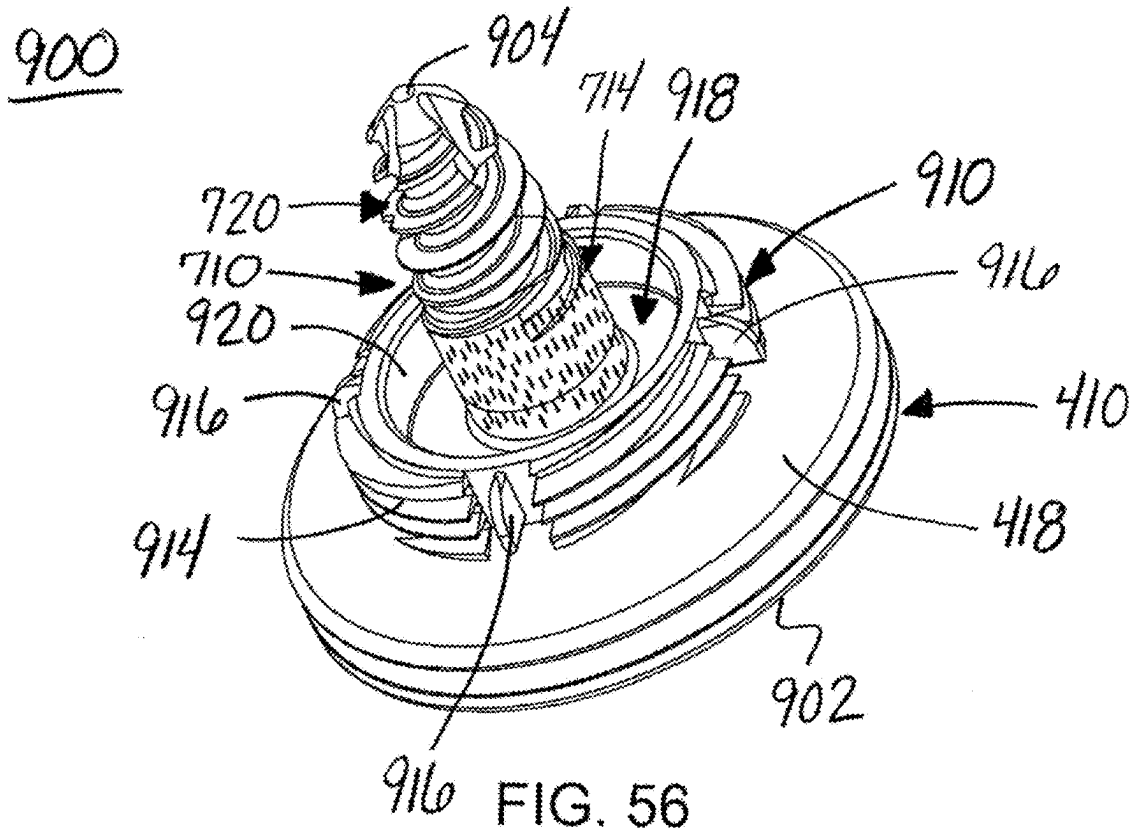
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FIG. 56

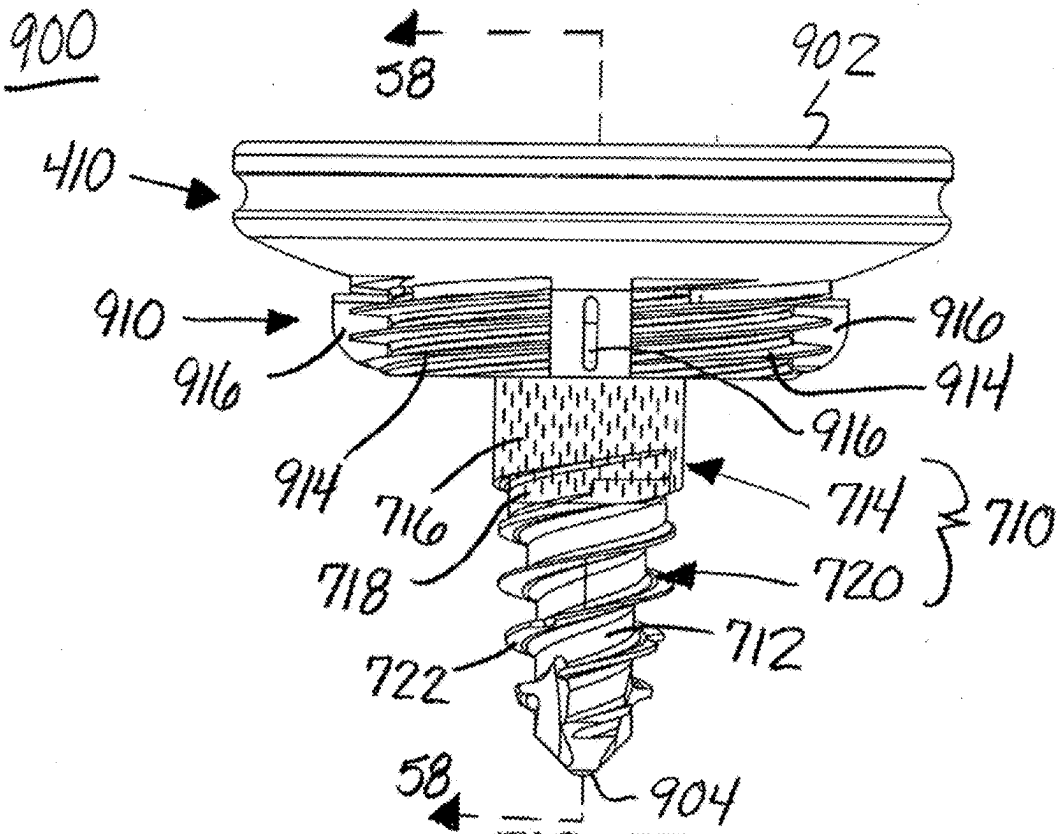
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FIG. 57

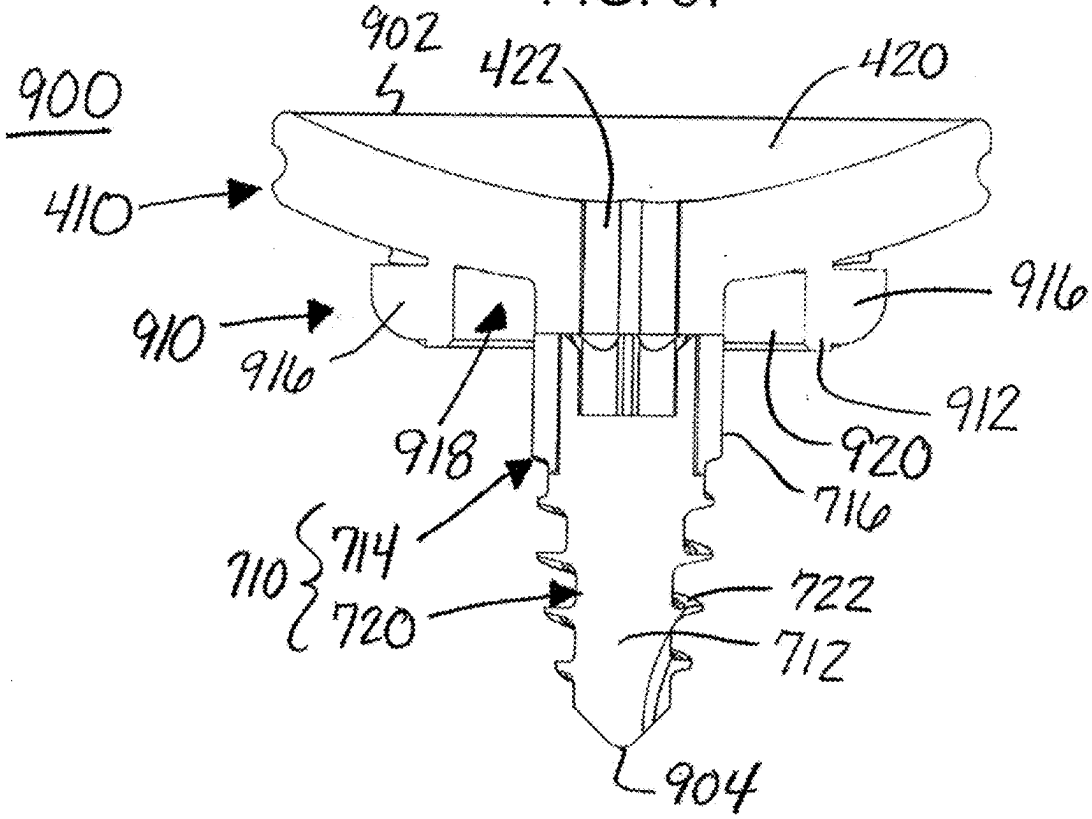
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FIG. 58

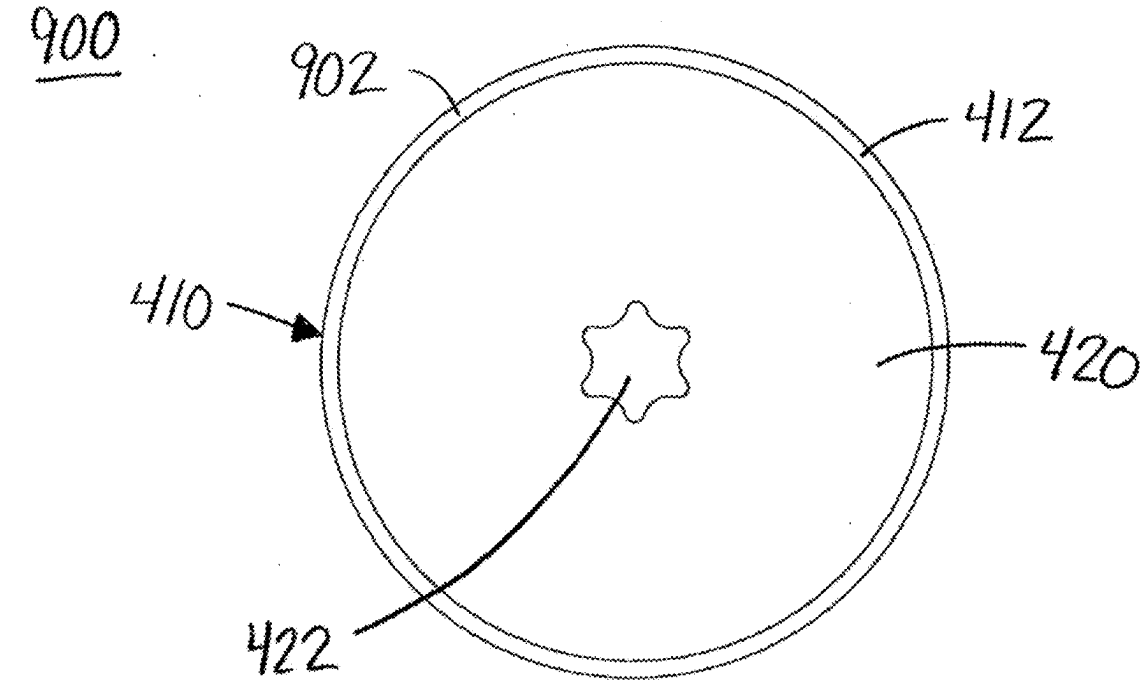
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FIG. 59

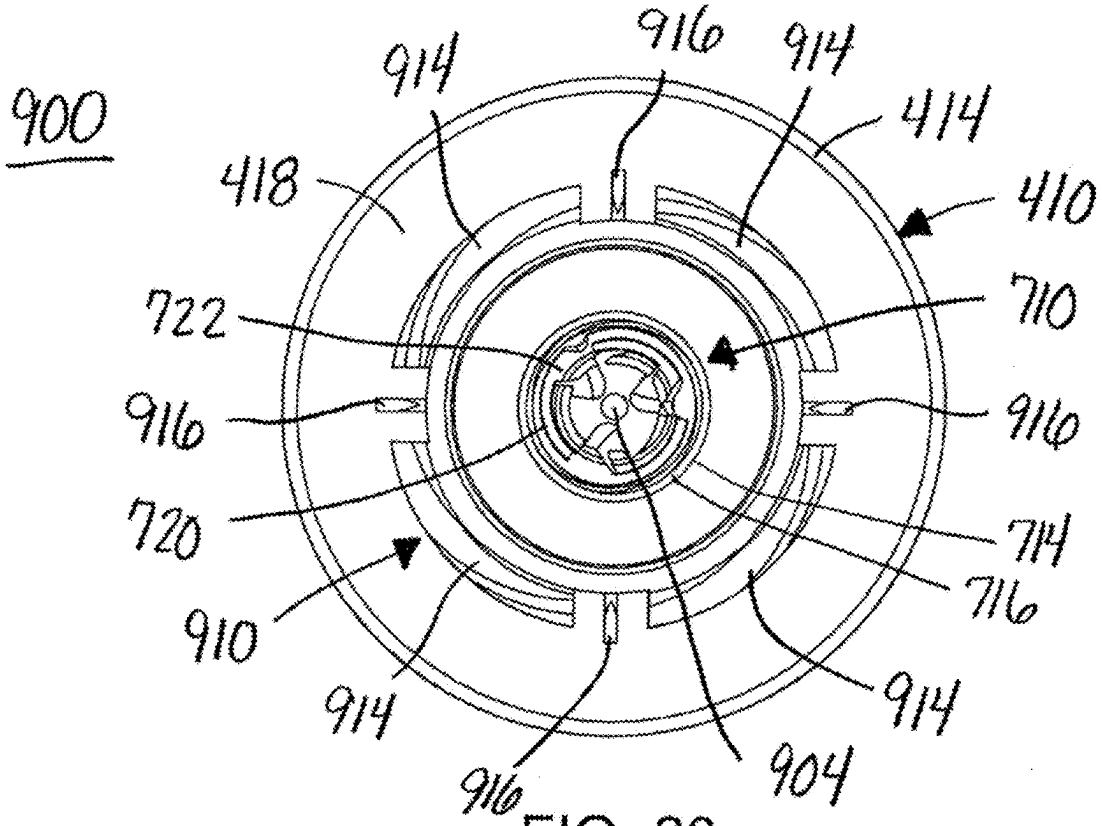
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FIG. 60

IMPLANTS, SYSTEMS AND METHODS OF USING THE SAME

[0001] This application is a continuation of U.S. patent application Ser. No. 17/247,025, which was filed on Nov. 24, 2020 and is a continuation-in-part of U.S. patent application Ser. No. 16/799,438, now U.S. Pat. No. 10,842,638, which was filed on Feb. 24, 2020 and is a continuation of Pat. Appl. No. PCT/US2019/043986 was filed on Jul. 29, 2019 and claims priority benefit under 35 U.S.C. § 119(e) to U.S. Prov. Pat. Appl. Ser. No. 62/711,425 was filed on Jul. 27, 2018. Each of the above-identified applications is incorporated herein by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention relates generally to general surgery, orthopedic implants used for replacing an articulation surface in a joint, such as shoulder prostheses. More specifically, but not exclusively, the present invention relates to the glenoid implants for anatomic shoulder arthroplasties, as well as methods for using the same.

BACKGROUND OF THE INVENTION

[0003] A natural shoulder joint may undergo degenerative changes due to a variety of causes. Accordingly, it is often necessary to replace a natural shoulder joint with a prosthetic shoulder joint. When implantation of such a shoulder joint prosthesis becomes necessary, the natural head portion of the humerus may be resected and a cavity may be created in the intramedullary canal of the host humerus for accepting a humeral component. The humeral component may include a head portion used to replace the natural head of the humerus. Once the humeral component has been implanted, the glenoid cavity positioned at the glenoid may also be resurfaced and shaped to accept a glenoid component. The glenoid component generally includes an articulating surface which is engaged by the head portion of the humeral component. Such an implant configuration is generally referred to as a traditional shoulder configuration.

[0004] In some instances, it may be necessary to convert the traditional shoulder configuration into a reverse shoulder configuration such as to achieve a higher level of constraint. In this regard, the humeral component and glenoid component may need to be removed and replaced with reverse shoulder components. When converting a traditional shoulder configuration to a reverse shoulder configuration, it is desirable to provide an efficient and minimally invasive transition on both the humeral side of the system and the glenoid side of the system. Exemplary shoulder implants are disclosed as follows:

[0005] U.S. Pat. No. 8,449,617 discloses a shoulder implant having a frame member, a cup, and a glenosphere. The frame member can have a central hub and a first arm extending therefrom. The frame member can be configured to selectively and alternatively couple with first shoulder implant components in a traditional shoulder configuration and with second shoulder implant components in a reverse shoulder configuration. The cup can have a concave surface that is configured to articulate with a humeral head component. The cup can be selectively coupled to the frame member in the traditional shoulder configuration. The glenosphere can have an outer articulating surface that is configured to articulate with a second cup. The glenosphere can be selectively coupled to the frame member in the reverse shoulder configuration.

[0006] U.S. Pat. No. 8,721,726 discloses a cup intended to interact with a prosthetic humeral head having a generally circular shape and positioning and anchoring devices for embedding the cup in an anatomical glenoid cavity in such a way that a load-bearing and sliding surface of the cup is integrated into the continuity of the anatomical cavity so as to be congruent with the humeral head.

[0007] U.S. Pat. No. 9,066,806 discloses a glenosphere configured to be mountable to a base plate. The glenosphere can be adapted to operate with a complementary humeral component. The base plate can include a removable taper member on a side of the base plate facing the glenosphere. The taper member can be configured to mount the glenosphere to the base plate.

[0008] U.S. Pat. No. 9,545,311 discloses a prosthesis that mechanically couples with both cancellous bone and cortical bone of a glenoid includes a head portion comprising a rear surface and an articular surface, an anchor member, and a plurality of deformable fins extending radially outward from the anchor member. The anchor member includes a distal end and a proximal end connected to the rear surface of the head portion. The plurality of deformable fins extend radially outward from the anchor member and includes at least a first proximal fin adjacent to the rear surface of the head portion positioned to engage with the cortical bone. The anchor member may also include at least one distal fin located proximate the distal end of the anchor member positioned to engage with the cancellous bone.

[0009] U.S. Pat. No. 9,844,440 discloses a glenoid implant including a body portion and a stem portion. The stem portion may extend from the body portion along a longitudinal axis. The body portion may include an articular side and a bone-engaging side opposite the articular side. At least a portion of the bone-engaging side may be disposed at a non-parallel angle relative to at least a peripheral edge of the articulation side.

[0010] U.S. Pat. No. 9,974,658 discloses a glenoid implant that has a protruding surface on a first side arranged to engage the surface of a cavity formed in a glenoid extending between peripheral glenoid surfaces and a flat surface adjacent the protruding surface of the implant arranged to engage the peripheral glenoid surfaces adjacent the cavity. The implant also has a wear-resistant surface on a second side opposite the flat surface and the protruding surface.

[0011] What is needed in the art is an anatomic shoulder glenoid implant having improved initial and long-term fixation while requiring minimal trauma to a patient's bone during implantation.

SUMMARY OF THE INVENTION

[0012] Aspects of the present invention provide glenoid implants for anatomic shoulder arthroplasties. The present invention also provides for methods for using the glenoid implants.

[0013] In one aspect, provided herein is an implant that includes a first portion, a second portion extending away from a bottom surface of the first portion, and a third portion

extending away from the bottom surface of the first portion, wherein the third portion extends through the second portion.

[0014] In another aspect, provided herein is an orthopedic glenoid implant, the implant including a head, the head including a bone contacting surface and an opposing articular surface; a circular ring having a hollow interior and an inner diameter, the ring extending from the bone contacting surface in a direction opposite the articular surface, the ring having a central axis and a depth; a post, the post extending from the bone contacting surface in a direction opposite the articular surface, the post having an exterior diameter and a length, the length of the post greater than the depth of the ring, the exterior diameter of the post smaller than the inner diameter of the ring, the post disposed within the ring; at least one cortical bone engaging fin, the at least one cortical bone engaging fin disposed around and extending radially from the ring; at least one cancellous bone engaging fin, the at least one cancellous bone engaging fin disposed around and extending radially from the post, wherein each cancellous bone engaging fin is farther from the bone engaging surface than each cortical bone engaging fin.

[0015] In yet another aspect, provided herein are surgical methods for inserting the implant systems.

[0016] These, and other objects, features and advantages of this invention will become apparent from the following detailed description of the various aspects of the invention taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0017] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate embodiments of the invention and together with the detailed description herein, serve to explain the principles of the invention. The drawings are only for purposes of illustrating preferred embodiments and are not to be construed as limiting the invention. It is emphasized that, in accordance with the standard practice in the industry, various features are not drawn to scale. In fact, the dimensions of the various features may be arbitrarily increased or reduced for clarity of discussion. The foregoing and other objects, features and advantages of the invention are apparent from the following detailed description taken in conjunction with the accompanying drawings in which:

[0018] FIG. **1** is a first perspective view of an embodiment of a glenoid implant, in accordance with an aspect of the present disclosure;

[0019] FIG. **2** is a second perspective view of the glenoid implant of FIG. **1**, in accordance with an aspect of the present disclosure;

[0020] FIG. **3** is a side view of the glenoid implant of FIG. **1**, in accordance with an aspect of the present disclosure;

[0021] FIG. **4** is a cross-sectional view of the glenoid implant of FIG. **1** taken along line **4--4** in FIG. **5**, in accordance with an aspect of the present disclosure;

[0022] FIG. **5** is a top view of the stemless humeral implant of FIG. **1**, in accordance with an aspect of the present disclosure;

[0023] FIG. **6** is a bottom view of the stemless humeral implant of FIG. **1**, in accordance with an aspect of the present disclosure;

[0024] FIG. **7** is an isometric view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0025] FIG. **8** is a side view of the glenoid implant of FIG. **7**, in accordance with an aspect of the present disclosure;

[0026] FIG. **9** is a side cross-sectional view of the glenoid implant of FIG. **7**, in accordance with an aspect of the present disclosure;

[0027] FIG. **10** is an isometric view of the glenoid implant of FIG. **7** implanted into a bone, in accordance with an aspect of the present disclosure;

[0028] FIG. **11** is a side view of the glenoid implant of FIG. **7** implanted into a bone, in accordance with the present disclosure;

[0029] FIG. **12** is a side cross-sectional view of the glenoid implant of FIG. **7** implanted into a bone, in accordance with an aspect of the present disclosure;

[0030] FIG. **13** is a perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0031] FIG. **14** is a side view of the glenoid implant of FIG. **13**, in accordance with an aspect of the present disclosure;

[0032] FIG. **15** is a bottom view of the glenoid implant of FIG. **13**, in accordance with an aspect of the present disclosure;

[0033] FIG. **16** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0034] FIG. **17** is a second perspective view of the glenoid implant of FIG. **16**, in accordance with an aspect of the present disclosure;

[0035] FIG. **18** is a side view of the glenoid implant of FIG. **16**, in accordance with an aspect of the present disclosure;

[0036] FIG. **19** is a cross-sectional view of the glenoid implant of FIG. **16** taken along line **19--19** in FIG. **16**, in accordance with an aspect of the present disclosure;

[0037] FIG. **20** is a first end view of the glenoid implant of FIG. **16**, in accordance with an aspect of the present disclosure;

[0038] FIG. **21** is a second end view of the glenoid implant of FIG. **16**, in accordance with an aspect of the present disclosure;

[0039] FIG. **22** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0040] FIG. **23** is a second perspective view of the glenoid implant of FIG. **22**, in accordance with an aspect of the present disclosure;

[0041] FIG. **24** is a side view of the glenoid implant of FIG. **22**, in accordance with an aspect of the present disclosure;

[0042] FIG. **25** is a cross-sectional view of the glenoid implant of FIG. **22** taken along line **25--25** in FIG. **22**, in accordance with an aspect of the present disclosure;

[0043] FIG. **26** is a cross-sectional view of the glenoid implant of FIG. **22** taken along line **26--26** in FIG. **24**, in accordance with an aspect of the present disclosure;

[0044] FIG. **27** is a perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0045] FIG. **28** is a side view of the glenoid implant of FIG. **27**, in accordance with an aspect of the present disclosure;

[0046] FIG. **29** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0047] FIG. **30** is a second perspective view of the glenoid implant of FIG. **29**, in accordance with an aspect of the present disclosure;

[0048] FIG. **31** is a side view of the glenoid implant of FIG. **29**, in accordance with an aspect of the present disclosure;

[0049] FIG. **32** is a cross-sectional view of the glenoid implant of FIG. **29** taken along line **32--32** in FIG. **29**, in accordance with an aspect of the present disclosure;

[0050] FIG. **33** is an end view of the glenoid implant of FIG. **29**, in accordance with an aspect of the present disclosure;

[0051] FIG. **34** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0052] FIG. **35** is a second perspective view of the glenoid implant of FIG. **34**, in accordance with an aspect of the present disclosure;

[0053] FIG. **36** is a side view of the glenoid implant of FIG. **34**, in accordance with an aspect of the present disclosure;

[0054] FIG. **37** is a cross-sectional view of the glenoid implant of FIG. **34** taken along line **37--37** in FIG. **34**, in accordance with an aspect of the present disclosure;

[0055] FIG. **38** is an end view of the glenoid implant of FIG. **34**, in accordance with an aspect of the present disclosure;

[0056] FIG. **39** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0057] FIG. **40** is a second perspective view of the glenoid implant of FIG. **39**, in accordance with an aspect of the present disclosure;

[0058] FIG. **41** is a side view of the glenoid implant of FIG. **39**, in accordance with an aspect of the present disclosure;

[0059] FIG. **42** is a cross-sectional view of the glenoid implant of FIG. **39** taken along line **42--42** in FIG. **39**, in accordance with an aspect of the present disclosure;

[0060] FIG. **43** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0061] FIG. **44** is a second perspective view of the glenoid implant of FIG. **43**, in accordance with an aspect of the present disclosure;

[0062] FIG. **45** is a side view of the glenoid implant of FIG. **43**, in accordance with an aspect of the present disclosure;

[0063] FIG. **46** is a cross-sectional view of the glenoid implant of FIG. **43** taken along line **46--46** in FIG. **43**, in accordance with an aspect of the present disclosure;

[0064] FIG. **47** is a perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0065] FIG. **48** is a side view of the glenoid implant of FIG. **47**, in accordance with an aspect of the present disclosure;

[0066] FIG. **49** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0067] FIG. **50** is a second perspective view of the glenoid implant of FIG. **49**, in accordance with an aspect of the present disclosure;

[0068] FIG. **51** is a side view of the glenoid implant of FIG. **49**, in accordance with an aspect of the present disclosure;

[0069] FIG. **52** is a cross-sectional view of the glenoid implant of FIG. **49** taken along line **52--52** in FIG. **49**, in accordance with an aspect of the present disclosure;

[0070] FIG. **53** is a first end view of the glenoid implant of FIG. **49**, in accordance with an aspect of the present disclosure;

[0071] FIG. **54** is a second end view of the glenoid implant of FIG. **49**, in accordance with an aspect of the present disclosure;

[0072] FIG. **55** is a first perspective view of another glenoid implant, in accordance with an aspect of the present disclosure;

[0073] FIG. **56** is a second perspective view of the glenoid implant of FIG. **55**, in accordance with an aspect of the present disclosure;

[0074] FIG. **57** is a side view of the glenoid implant of FIG. **55**, in accordance with an aspect of the present disclosure;

[0075] FIG. **58** is a cross-sectional view of the glenoid implant of FIG. **55** taken along line **58--58** in FIG. **57**, in accordance with an aspect of the present disclosure;

[0076] FIG. **59** is a first end view of the glenoid implant of FIG. **55**, in accordance with an aspect of the present disclosure; and

[0077] FIG. **60** is a second end view of the glenoid implant of FIG. **55**, in accordance with an aspect of the present disclosure.

DETAILED DESCRIPTION FOR CARRYING OUT THE INVENTION

[0078] Generally stated, disclosed herein are glenoid implants for shoulder prostheses. Further, surgical methods for using the glenoid implants are discussed.

[0079] In this detailed description and the following claims, the words proximal, distal, anterior, posterior, medial, lateral, superior and inferior are defined by their standard usage for indicating a particular part of a bone or implant according to the relative disposition of the natural bone or directional terms of reference. For example, "proximal" means the portion of a device or implant nearest the torso, while "distal" indicates the portion of the device or implant farthest from the torso. As for directional terms, "anterior" is a direction towards the front side of the body, "posterior" means a direction towards the back side of the body, "medial" means towards the midline of the body, "lateral" is a direction towards the sides or away from the midline of the body, "superior" means a direction above and "inferior" means a direction below another object or structure.

[0080] As used herein, the word "exemplary" or "illustrative" means "serving as an example, instance, or illustration." Any implementation described herein as "exemplary" or "illustrative" is not necessarily to be construed as preferred or advantageous over other implementations. Moreover, in the present description, the terms "upper", "lower", "left", "rear", "right", "front", "vertical", "horizontal", and derivatives thereof shall relate to the invention as oriented in the first figure of each embodiment.

[0081] Similarly, positions or directions may be used herein with reference to anatomical structures or surfaces. For example, as the current implants, devices, systems and methods are described herein with reference to use with the bones of the shoulder, the bones of the shoulder and upper arm may be used to describe the surfaces, positions, directions or orientations of the implants, devices, systems and methods. Further, the implants, devices, systems and methods, and the aspects, components, features and the like thereof, disclosed herein are described with respect to one side of the body for brevity purposes. However, as the human body is relatively symmetrical or mirrored about a line of symmetry (midline), it is hereby expressly contemplated that the implants, devices, systems and methods, and the aspects, components, features and the like thereof, described and/or illustrated herein may be changed, varied, modified, reconfigured or otherwise altered for use or association with another side of the body for a same or similar purpose without departing from the spirit and scope of the invention. For example, the implants, devices, systems and methods, and the aspects, components, features and the like thereof, described herein with respect to the right shoulder may be mirrored so that they likewise function with the left shoulder and vice versa. Further, the implants, devices, systems and methods, and the aspects, components, features and the like thereof, disclosed herein are described with respect to the shoulder for brevity purposes, but it should be understood that the implants, devices, systems and methods may be used with other bones of the body having similar structures, for example the lower extremity, and more specifically, with the bones of the ankle, foot, and leg.

[0082] Referring to the drawings, wherein like reference numerals are used to indicate like or analogous components throughout the several views, and with particular reference to FIGS. **1-6**, there is illustrated an embodiment of a glenoid implant **100**. The glenoid implant **100** includes a first end or lateral end **102** and a second end or medial end **104**. The first end **102** is positioned opposite the second end **104**. The glenoid implant **100** also includes a first portion or lateral portion **110**, a second portion or intermediate portion **130**, and third portion or medial portion **150**. The first portion **110** may extend from the first end **102** toward the second end **104**. The second portion **130** may extend away from a bottom surface of the first portion **110** toward the second end **104**. The third portion **150** may also extend away from the bottom surface of the first portion **110** to the second end **104**. The third portion **150** may extend through a central opening of the second portion **130**.

[0083] With continued reference to FIGS. **1-6**, the first portion **110** may include an exterior surface **112**, **114**, **116**, **118** and an interior surface, articulating surface, or concave surface **120**. The articulating surface **120** may be positioned on the first end **102** of the glenoid implant **100** and may be, for example, curved or arced into the first portion **110**. More specifically, the articulating surface **120** may have, for example, a cone or spherical articular surface. Further, the articulating surface **120** may have, for example, a hybrid coned and spherical articular surface, as shown in FIG. **4**, enabling conformity with any size humeral head to prevent sliding of the head superiorly. The exterior surface **112**, **114**, **116**, **118** may include a first rim or distal rim **112**, a second rim or proximal rim **114**, a groove or circumferential channel **116**, and a tapered region or bone contacting surface **118**. The first rim **112** may extend circumferentially around the first portion **110**. The second rim **114** may also extend circumferentially around the first portion **110** and may be spaced apart from the first rim **112**. The groove **116** may be positioned between the first rim **112** and the second rim **114**. The groove **116** may also be inset into the exterior surface of the first portion **110**. The tapered region **118** may extend from the second rim **114** to the second portion **130**. The tapered region **118** may also be, for example, angled, curved, or arced as it extends between the second rim **114** and the second portion **130**.

[0084] As shown in FIGS. **1-6**, the second portion **130** may include a base member or extension member **132** extending away from the tapered region **118** toward the second end **104** of the glenoid implant **100**. The base member **132** may be, for example, a constant or continuous ring extending circumferentially around the bottom of the tapered region **118** of the first portion **110**. Although not shown, it is also contemplated that the base member **132** may be non-continuous or include gaps, spaces or the like interruptions around the circumference of the base member **132**. The base member **132** may be, for example, configured or sized and shaped to provide improved fixation and support to the glenoid implant **100**. The second portion **130** may also include a first lip **134** and a second lip **136** extending circumferentially around the exterior surface of the second portion **130**. As shown the base member include two lips **134**, **136**, however, alternative numbers of lips **134**, **136** are also contemplated and may range from, for example, one lip to five lips. The lips **134**, **136** may extend away from the base member **132**, for example, in a range of approximately 12 mm to approximately 31 mm. In addition, the second portion **130** may include a recessed region or opening **138** extending through the second portion **130** and forming an interior surface **140** of the base member **132**. The interior surface **140** is positioned opposite the first lip **134** and the second lip **136** on the base member **132**. The first and second lips **134**, **136** may be, for example, locking fins designed for cortical fixation.

[0085] Referring now to FIGS. **1-4** and **6**, the third portion or medial portion **150** may include a stem **152**, at least one protrusion **154**, and a medial end member **156**. The stem or central post **152** may extend away from the bottom of the bone contacting surface **118** of the first portion **110** through the base member **132**. The stem **152** may, for example, have a uniform diameter along its entire length, be tapered along its entire length, or have a combination of portions with a uniform diameter and portions tapered along their length. For example, as shown in FIGS. **2-4**, the stem **152** may be tapered as it extends towards the second end **104** from the bottom of the bone contacting surface **118** to a first protrusion **154**, thereafter, the stem **152** may have a uniform diameter until engages the medial end member **156**. The at least one protrusion or locking fin **154** may extend away from the stem **152**, for example, circumferentially forming a constant or continuous member. As shown the at least one protrusion **154** may be, for example, three protrusions. Alternative numbers of protrusions are also contemplated and may range from, for example, two protrusions to eight protrusions. The medial end member or locking fin **156** may have, for example, a disk-like or coin-like shape coupled to the end of stem **152**. The medial end member **156** may have a first diameter, the end of the stem **152** positioned at the second end **104** of the glenoid implant **100** may have a second diameter, and the first diameter may be larger than

the second diameter. In addition, the at least one protrusion **154** may have third diameter and the third diameter may be larger than both the first diameter and the second diameter. The at least one protrusion **154** and the medial end member **156** form locking fins surrounding the stem **152** which may be, for example, configured or sized and shaped for cancellous fixation.

[0086] Referring now to FIGS. **7-12**, an isometric view of a glenoid implant **200** is shown. As shown in FIG. **7**, the implant **200** includes a generally cylindrically shaped head **210** with a concave articular surface **212** and an opposite preferably convex bone contacting surface **214**. FIG. **10** shows the implant **200** implanted into a bone.

[0087] With continued reference to FIGS. **9** and **12**, the implant **200** also includes a circular ring **216** with a hollow interior **218** and an inner diameter. The ring **216** extends from the bone contacting surface **214** in a direction opposite the articular surface **212**. The ring **216** has a central axis and a depth. Although not shown, it is also contemplated that the ring **216** may be non-continuous or include gaps, spaces, or like interruptions around the circumference of the ring **216**. The implant **200** further includes at least one cortical bone engaging fin **220** disposed around and extending radially from the ring **216**. Preferably, at least two (2) fins **220** extend from the ring **216**. The fins **220** may include, for example, a plurality of teeth or protrusions **226** spaced circumferentially around the exterior surface of the fins **220**. The fins **220** may, for example, partially flex when the ring **216** is inserted into cortical bone, such as illustrated in FIGS. **10-12**. The fins **220** may extend, for example, from the ring **216** at an obtuse or acute angle. Alternatively, the fins **220** may extend from the ring **216** horizontally, i.e. at a 90-degree angle. It is also contemplated that the fins **220** may be, for example, non-continuous or include gaps, spaces, or interruptions as the fins **220** extend around the circumference of the ring **216**.

[0088] Referring again to FIGS. **8** and **9**, the implant **200** also includes a post or stem **222** extending from the bone contacting surface **214** in a direction opposite articular surface **212**. The post **222** has an exterior diameter and a length. The length of the post **222** is greater than the depth of the ring **216**. The exterior diameter of the post **222** is less than the inner diameter of the ring **216**. The post **222** is disposed within the ring **216** such that the post **222** and the ring **216** share a common central axis.

[0089] With continued reference to FIGS. **8** and **9**, the implant **200** also includes at least one cancellous bone engaging fin **224** disposed around and extending radially from the post **222**. The at least one cancellous bone engaging fin **224** may be, for example, at least two (2) fins **224** extending from the post **222**. The fins **224** partially flex when the post **222** is inserted into cancellous bone as illustrated in FIGS. **10-12**. The fins **224** preferably extend from the post **222** at an angle, for example, an obtuse or acute angle. However, the fins **224** may also extend from the post **222** horizontally, i.e. at a 90-degree angle. Each cancellous bone engaging fin **224** is farther from the bone engaging surface **214** than each cortical bone engaging fin **220**.

[0090] Advantageously, the implant **200** discretely engages and locks into cancellous bone and separately into cortical bone. The bone may be prepared to receive the implant **200** by a reaming operation. Moreover, the ring **216** of implant **200** can also be adapted to a reverse baseplate.

[0091] The wider, shallower ring **216** designed for cortical engagement provides for fixation farther toward the edge of the implant **200** and reduces the chance of implant movement. Glenoid implants may be subjected to what is called "rocking horse" where the edges lift up when the humeral head puts pressure on the opposite side of the implant. Fixation out towards the edge is ideal to prevent this from happening. Other devices include pegs on the outer periphery to achieve stabilization, but glenoid rigidity could be compromised from a large quantity of holes; so, there is limited ability to prevent rocking horse.

[0092] In addition, the wider, shallower ring **216** on the outside and the longer, thinner post **222** on the inside are more conducive to the shape of the glenoid vault. The glenoid is widest at the articular surface and necks down rapidly. Perforation through the far cortex with a reaming or drilling operation is not ideal as cement can leak out those perforations and into the joint space and can be undetected. Devices with multiple peripheral pegs that are long enough can achieve stabilization, but they can perforate. Thus, the constant shallow ring **216** of implant **200** provides for better stabilization without such perforation.

[0093] Referring now to FIGS. **13-15**, another glenoid implant **300** is shown. The glenoid implant **300** may include a first end **302** and a second end **304**. The glenoid implant **300** may also include a first portion or lateral portion **310**, a second portion or intermediate portion **320**, and third portion or medial portion **330**. The first portion **310** may extend from the first end **302** toward the second end **304** the second portion **320** may extend away from a bottom surface of the first portion **310** toward the second end **304**. The third portion **330** may extend through a central opening of the second portion **320**. The implant **300** may have, for example, a porous metal ring or third portion **330** and a porous metal post or stem (not shown) with a compression molded poly articular surface or molded polymer articular surface **316**. The porous metal post or stem (not shown) may be, for example, tapered as it extends away from the bottom surface of the lateral portion **310**.

[0094] With continued reference to FIGS. **13-15**, the first portion **310** may include a rim or exterior surface **312**, a tapered region or bone contacting surface **314**, and an arced to articulating surface, concave surface or anterior surface **316**. The exterior surface **312** may be, for example, generally flat or planar as that extends between the first end **102** and the bone contacting surface **314**. As shown in FIG. **15**, the exterior surface **312** may have, for example, a cylindrical shape.

[0095] The articulating surface **316** may be positioned on the first end **302** of the glenoid implant **300** and may be, for example, curved or arced into the first portion **310**. More specifically, the articulating surface **316** may have, for example, a cone or spherical articular surface. Further, the articulating surface **316** may have, for example, a hybrid coned and spherical articular surface (not shown) enabling head to prevent sliding of the head superiorly. The bone contacting surface **314** may extend from the bottom of the rim **312** to the second portion **320**. The bone contacting surface **314** may be, for example, angled, curved, or arced as they extend between the bottom of the rim **312** and the second portion **320**.

[0096] As shown in FIGS. **13-15**, the second portion **320** may extend away from the tapered region **314** toward the second end **304** of the glenoid implant **100**. The second portion **320** may be, for example, a constant or continuous ring extending circumferentially around the bottom of the

tapered region **314** of the first portion **310**. The second portion **320** may be, for example, straight or tapered as it extends from the bone contacting surface **314**. Although not shown, it is also contemplated that the second portion **320** may be non-continuous or include gaps, spaces or the like interruptions around the circumference of the second portion **320**. The second portion **320** may be, for example, configured or sized and shaped to provide improved fixation and support to the glenoid implant **300**. The second portion **320** may have, for example, a textured surface or textured coating **322**. The textured surface **322** may, for example, assist with cortical fixation. In addition, the second portion **320** may include a recessed region or opening **324** extending through the second portion **320** and forming an interior surface **326** of the second portion **320**. The interior surface **326** is positioned opposite an exterior surface.

[0097] Referring now to FIGS. **13** and **14**, the third portion or medial portion **330** may include a stem **332**, at least one protrusion **334**, and a medial end member **336**. The stem or central post **332** may extend away from the bottom of the bone contacting surface **314** of the first portion **310** through the second portion **320** the stem **332** may, for example, have a uniform diameter along its entire length, be tapered along its entire length, or have a combination of portions with a uniform diameter and portions which are tapered along their length. For example, as shown in FIGS. **13** and **14**, the stem **332** may be tapered as the stem **332** extends towards the second end **304** from the bottom of the bone contacting surface **314** to a first protrusion **334**, thereafter, the stem may have a uniform diameter until the stem **332** engages the medial end member **336**. The at least one protrusion or locking fin **334** may extend away from the stem **332**, for example, circumferentially forming a constant or continuous member. As shown, the at least one protrusion **334** may be, for example, to protrusions **334**. Alternative numbers of protrusions **334** are also contemplated and may range from, for example, two protrusions to eight protrusions. The medial end member or locking fin **336** may have, for example, a disk-like or coin-like shape coupled to the end of stem **332**. The medial end member **336** may have a first diameter, the end of the stem **332** positioned at the second end **304** of the glenoid implant **300** may have a second diameter, and the first diameter may be larger than the second diameter. In addition, the at least one protrusion **334** may have third diameter and the third diameter may be larger than both the first diameter and the second diameter. The at least one protrusion **334** and the medial end member **336** and locking fence surrounding the stem **332** which may be, for example, configured or sized and shaped for cancellous fixation.

[0098] A surgical method for implanting the glenoid implants **100**, **200**, **300**, may include preparing the patient's joint by performing sizing and alignment steps. Next, the bone may be reamed to form a channel and recess to receive the glenoid implant **100**, **200**, **300**. Once the bones are prepared, implant trials may be used to determine the desired size of the glenoid implant **100**, **200**, **300** for implantation. Next the selected glenoid implant **100**, **200**, **300** may be inserted and coupled to the bones. Finally, the surgical procedure may be completed, and the patient's incision may be closed.

[0099] Referring now to FIGS. **16-21**, another glenoid implant **400** is shown. The glenoid implant **400** includes a first end or lateral end **402** and a second end or medial end **404**. The first end **402** is positioned opposite the second end **404**. The glenoid implant **400** also includes a first portion or medial portion **410**, a second portion or intermediate portion **430**, and third portion or lateral portion **450**. The first portion **410** may extend from the first end **402** toward the second end **404**. The second portion **430** may extend away from a bottom surface of the first portion **410** toward the second end **404**. The third portion **450** may also extend away from the bottom surface of the first portion **410** to the second end **404**. The third portion **450** may extend through a central opening **436** of the second portion **430**. The first portion **410** may be made of, for example, a polymer material. The second portion **430** and third portion **450** may be made of, for example, a metal.

[0100] With continued reference to FIGS. **16-21**, the first portion **410** may include an exterior surface **412**, **414**, **416**, **418** and an interior surface, articulating surface, or concave surface **420**. The articulating surface **420** may be positioned on the first end **402** of the glenoid implant **400** and may be, for example, curved or arced into the first portion **410**. More specifically, the articulating surface **420** may have, for example, a cone or spherical articular surface. Further, the articulating surface **420** may have, for example, a hybrid coned and spherical articular surface, as shown in FIG. **19**, enabling conformity with any size humeral head to prevent sliding of the head superiorly. The articulating surface **420** may also include a drive opening **422**. The drive opening **422** may be positioned, for example, at the center of the articulating surface **420**. The drive opening **422** may be, for example, aligned with and extend into at least a portion of the third portion **450**. The drive opening **422** may have, for example, a lobed shape or alternatively may have another shape for receiving a tool for driving the implant **400** into a patient's glenoid. The exterior surface **412**, **414**, **416**, **418** may include a first rim or distal rim **412**, a second rim or proximal rim **414**, a groove or circumferential channel **416**, and a tapered region or bone contacting surface **418**. The first rim **412** may extend circumferentially around the first portion **410**. The second rim **414** may also extend circumferentially around the first portion **410** and may be spaced apart from the first rim **412**. The groove **416** may be positioned between the first rim **412** and the second rim **414**. The groove **416** may also be inset into the exterior surface of the first portion **410**. The tapered region **418** may extend from the second rim **414** to the second portion **430**. The tapered region **418** may also be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **430**.

[0101] As shown in FIGS. **16-21**, the second portion **430** may include a base member or extension member **432** extending away from the tapered region **418** toward the second end **404** of the glenoid implant **400**. The base member **432** may be, for example, a constant or continuous ring extending circumferentially around the bottom of the tapered region **418** of the first portion **410**. The base member **432** may be, for example, configured or sized and shaped to provide improved fixation and support to the glenoid implant **400**. The second portion **430** may also include threads **434** extending circumferentially around the exterior surface of the second portion **430**. As shown, the base member include threads **434** extending in the same direction as the threads **456**, **460** of the third portion **450**, however, alternative arrangements of the threads **434** are also contemplated. In addition, the second portion **430** may include

a recessed region or opening **436** extending through the second portion **430** and forming an interior surface **438** of the base member **432**. The interior surface **438** is positioned opposite the threads **434** on the base member **432**. The threads **434** may be, for example, designed to interfere and deform as the threads **434** advance into the prepared trough. The threads **434** may also be, for example, configured or timed to the metal threads.

[0102] Referring now to FIGS. **16-19**, the third portion or lateral portion **450** may include a stem **452** with a first segment **454**, and a second segment **458**. The stem or central post **452** may extend away from the bottom of the bone contacting surface **418** of the first portion **410** through the base member **432**. The first segment **454** may extend away from the bottom of the bone contacting surface **418** through the base member **432** toward the second end **404**. The second segment **458** may extend away from the bottom of the first segment **454** to the second end **404**. The first segment **454** may have, for example, a first diameter and a first length. The second segment **458** may have, for example, a second diameter and a second length. The first diameter may be, for example, larger than the second diameter. The first length may be, for example, shorter than the second length. The first segment **454** may include first threads **456** extending around the circumference of the first segment **454**. The first segment **454** is configured to, for example, anchor into the far cortex of the glenoid. The second segment **458** may include second threads **460** extending around the second segment **458**. The second segment **458** is configured to, for example, anchor into the subchondral plate of the glenoid. The first threads **456** and second threads **460** are, for example, timed to advance at the same rate.

[0103] The implant **400** may be inserted into a patient by preparing the glenoid bone to receive the implant **400**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **458** of the stem **452**, a larger hole in the subchondral plate to receive the first segment **454** of the stem **452**, and a prepared trough to receive the base member **432**. Once the glenoid is prepared, then the implant **400** may be rotated or spun using a tool and the drive opening **422** to advance the implant **400** into the bone. After the implant **400** is seated in the prepared openings, the surgical procedure may be completed.

[0104] Referring now to FIGS. **22-26**, another glenoid implant **500** is shown. The implant **500** is as described with respect to implant **400** and which similar or identical features will not be described again here for brevity sake. Implant **500** also includes a plurality of openings or fenestrations **510** extending through the second threads **460** in a direction extending between a first end **502** and a second end **504** of the implant **500**. The plurality of openings **510** may be, for example, spaced apart and extend along the thread **460** as the thread **460** extends between the first segment **454** and the second end **504**. The openings **510** may have, for example, a generally oval shape and may be curved along the curvature of the thread **460** as it extends around the first segment **454** of the stem **452**. The openings **510** may extend along, for example, the entire length of the thread or only a portion of the thread between the first segment **454** and the second end **504**. The openings **510** allow for bone through growth after implantation, as described in greater detail above and which will not be described again here for brevity sake. The bone through growth allows for additional long-term fixation.

[0105] Referring now to FIGS. **27-28**, another glenoid implant **550** is shown. The glenoid implant **550** may be as described above with reference to implant **400** and which similar or identical features will not be described again here for brevity sake. Implant **550** also includes a textured surface **560** positioned along at least a portion of the second segment **458** of the stem **452**. The textured surface **560** may be, for example, a porous material, porous metal, lattice structure, or the like surface to allow for bone on-growth or in-growth. The textured surface **560** may be, for example, formed by spraying, additive manufacturing, or another process for creating a surface texture on a medical implant as known by one of ordinary skill in the art. The textured surface **560** may be constructed to have a structure that is, for example, stochastic, randomized, uniform or a combination of the same. In an embodiment, the textured surface **560** may extend from the point where the second segment **458** couples to the first segment **454** toward the second end **554** of the implant **550**.

[0106] Alternative lengths of the textured surface **560** are also contemplated along the exterior surface of the second segment **458** of the stem **452** in a direction extending between the first end **552** and the second end **554** of the implant **550**. The textured surface **560** may be, for example, positioned on the exterior surface of the second segment **458** of the stem **452**, the threads **460**, or the exterior surface of the second segment **458** and the threads **460**. The textured surface **560** may be formed or applied to the implant **550** by any known means for forming or applying a porous metal for orthopedic applications. Once implanted, bone may grow into the textured surface **560**. The ingrowth of bone into the porous metal **560** may provide additional long-term fixation.

[0107] Referring now to FIGS. **29-33**, another glenoid implant **600** is shown. The glenoid implant **600** includes a first end or lateral end **602** and a second end or medial end **604**. The first end **602** is positioned opposite the second end **604**. The glenoid implant **600** also includes a first portion or medial portion **410**, a second portion or intermediate portion **610**, and third portion or lateral portion **630**. The first portion **410** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. The second portion **610** may extend away from a bottom surface of the first portion **410** toward the second end **604**. The third portion **630** may also extend away from the bottom surface of the first portion **410** to the second end **604**. The third portion **630** may extend through a central opening **618** of the second portion **610**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **610**.

[0108] With continued reference to FIGS. **29-33**, the second portion **610** may include a base member or extension member **612** extending away from the tapered region **418** toward the second end **604** of the glenoid implant **600**. The base member **612** may be, for example, a constant or continuous ring extending circumferentially around the bottom of the tapered region **418** of the first portion **410**. Although not shown, it is also contemplated that the base member **612** may be non-continuous or include gaps, spaces or the like interruptions around the circumference of the base member **612**. The base member **612** may be, for example, configured or sized and shaped to provide improved fixation and support to the glenoid implant **600**. The second portion **610** may also include a first lip **614** and

a second lip **616** extending circumferentially around the exterior surface of the second portion **610**. As shown, the base member **612** include two lips **614**, **616**, however, alternative numbers of lips **614**, **616** are also contemplated and may range from, for example, one lip to five lips. The lips **614**, **616** may extend away from the base member **612**, for example, in a range of approximately 12 mm to approximately 31 mm. In addition, the second portion **610** may include a recessed region or opening **618** extending through the second portion **610** and forming an interior surface **620** of the base member **610**. The interior surface **620** is positioned opposite the first lip **614** and the second lip **616** on the base member **612**. The first and second lips **614**, **616** may be, for example, locking fins designed for cortical fixation.

[0109] Referring again to FIGS. **29-33**, the third portion or lateral portion **630** may include a stem **632** with a first segment **634**, and a second segment **640**. The stem or central post **632** may extend away from the bottom of the bone contacting surface **418** of the first portion **410** through the base member **612**. More specifically, the first segment **634** may extend away from the bottom of the bone contacting surface **418** through the base member **612** toward the second end **604**. The second portion **610** may extend away from the bottom of the first segment **634** to the second end **604**. The first segment **634** may have, for example, a first diameter and a first length. The second segment **640** may have, for example, a second diameter and a second length. The first diameter may be, for example, larger than the second diameter. The first length may be, for example, shorter than the second length. The first segment **634** may include a non-threaded surface **636** and the thread start **636** extending around the circumference of the first segment **634**. The first segment **634** is configured to, for example, anchor into the far cortex of the glenoid. The second segment **640** may include threads **642** extending around the second segment **640**. The second segment **640** is configured to, for example, anchor into the subchondral plate of the glenoid.

[0110] The implant **600** may be inserted into a patient by preparing the glenoid bone to receive the implant **600**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **640** of the stem **632**, a larger hole in the subchondral plate to receive the first segment **634** of the stem **632**, and a prepared trough to receive the base member **612**. Once the glenoid is prepared, then the implant **600** may be rotated or spun using a tool and the drive opening **422** to advance the implant **600** into the bone. After the implant **600** is seated in the prepared openings, the surgical procedure may be completed.

[0111] Referring now to FIGS. **34-38**, another glenoid implant **650** is shown. The glenoid implant **650** includes a first end or lateral end **652** and a second end or medial end **654**. The first end **652** is positioned opposite the second end **654**. The glenoid implant **650** also includes the first portion or medial portion **410**, the second portion or intermediate portion **430**, and third portion or lateral portion **630**. The first portion **410** and the second portion **430** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. The second portion **430** may extend away from a bottom surface of the first portion **410** toward the second end **654**. The third portion **630** may be as described in greater detail above with respect to implant **600** and which will not be described again here for brevity sake. The third portion **630** may also extend away from the bottom surface of the first portion **410** to the second end **654**. The third portion **630** may extend through a central opening **436** of the second portion **430**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **430**.

[0112] The implant **650** may be inserted into a patient by preparing the glenoid bone to receive the implant **650**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **640** of the stem **632**, a larger hole in the subchondral plate to receive the first segment **634** of the stem **632**, and a prepared trough to receive the base member **432**. Once the glenoid is prepared, then the implant **650** may be rotated or spun using a tool and the drive opening **422** to advance the implant **650** into the bone. After the implant **650** is seated in the prepared openings, the surgical procedure may be completed.

[0113] Referring now to FIGS. **39-42**, another glenoid implant **700** is shown. The glenoid implant **700** includes a first end or lateral end **702** and a second end or medial end **704**. The first end **702** is positioned opposite the second end **704**. The glenoid implant **700** also includes the first portion or medial portion **410**, the second portion or intermediate portion **610**, and a third portion or lateral portion **710**. The first portion **410** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. The second portion **610** may extend away from a bottom surface of the first portion **410** toward the second end **704**. The second portion **610** may be as described in greater detail above with respect to implant **600** and which will not be described again here for brevity sake. The third portion **710** may also extend away from the bottom surface of the first portion **410** to the second end **704**. The third portion **710** may extend through a central opening **618** of the second portion **610**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **610**.

[0114] The third portion **710** may include a stem **712** with a first segment **714** and a second segment **720**. The stem or central post **712** may extend away from the bottom of the bone contacting surface **418** of the first portion **410** through the base member **612**. The first segment **714** may extend away from the bottom of the bone contacting surface **418** through the base member **612** toward the second end **704**. The second segment **720** may extend away from the bottom of the first segment **714** to the second end **704**. The first segment **714** may have, for example, a first diameter and a first length. The second segment **720** may have, for example, a second diameter and a second length. The first diameter may be, for example, larger than the second diameter. The first length may be, for example, shorter than the second length. The first segment **714** may include a porous metal surface **716** and a thread start **718** extending around at least a portion of the circumference of the first segment **714**. The porous metal surface **716** may be as described with reference to porous metal surface **560** and which will not be described again here for brevity sake. The first segment **714** is configured to, for example, anchor into the far cortex of the glenoid. The second segment **720** may include threads **722** extending around the second segment **720**. The second segment **720** is configured to, for example, anchor into the subchondral plate of the glenoid.

[0115] The implant **700** may be inserted into a patient by preparing the glenoid bone to receive the implant **700**. The

glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **720** of the stem **712**, a larger hole in the subchondral plate to receive the first segment **714** of the stem **712**, and a prepared trough to receive the base member **612**. Once the glenoid is prepared, then the implant **700** may be rotated or spun using a tool and the drive opening **422** to advance the implant **700** into the bone. After the implant **700** is seated in the prepared openings, the surgical procedure may be completed.

[0116] Referring now to FIGS. **43-46**, another glenoid implant **750** is shown. The glenoid implant **750** includes a first end or lateral end **752** and a second end or medial end **754**. The first end **752** is positioned opposite the second end **754**. The glenoid implant **750** also includes a first portion or medial portion **410**, a second portion or intermediate portion **430**, and third portion or lateral portion **710**. The first portion **410** and the second portion **430** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. The second portion **430** may extend away from a bottom surface of the first portion **410** toward the second end **754**. The third portion **710** may also extend away from the bottom surface of the first portion **410** to the second end **754**. The third portion **710** may extend through a central opening **436** of the second portion **430**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **430**.

[0117] The implant **750** may be inserted into a patient by preparing the glenoid bone to receive the implant **750**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **720** of the stem **712**, a larger hole in the subchondral plate to receive the first segment **714** of the stem **712**, and a prepared trough to receive the base member **432**. Once the glenoid is prepared, then the implant **750** may be rotated or spun using a tool and the drive opening **422** to advance the implant **750** into the bone. After the implant **750** is seated in the prepared openings, the surgical procedure may be completed.

[0118] Referring now to FIGS. **47-48**, another glenoid implant **800** is shown. The glenoid implant **800** includes a first end or lateral end **802** and a second end or medial end **804**. The first end **802** is positioned opposite the second end **804**. The glenoid implant **800** also includes the first portion or medial portion **410**, the second portion or intermediate portion **430**, and the third portion or lateral portion **710**. The first portion **410** and the second portion **430** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. However, the threads **810** of the second portion **430** are the reverse of the threads **434** of implant **750**. The second portion **430** may extend away from a bottom surface of the first portion **410** toward the second end **804**. The third portion **710** may also extend away from the bottom surface of the first portion **410** to the second end **804**. The third portion **710** may extend through a central opening **436** of the second portion **430**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **430**.

[0119] As the implant **800** is inserted into a patient, the threads **810** on the second portion **430** are deformable and are pulled into the trough by the metallic right-handed thread **722** of the stem **712**. The left-handed threads **810** will assist in preventing the unscrewing of the implant **800** after inserted into the patient. Alternatively, the threads **810** may be right-handed threads and the threads **722** may be left-handed threads.

[0120] Referring now to FIGS. **49-54**, another glenoid implant **850** is shown. The glenoid implant **850** includes a first end or lateral end **852** and a second end or medial end **854**. The first end **852** is positioned opposite the second end **854**. The glenoid implant **850** also includes a first portion or medial portion **810**, a second portion or intermediate portion **430**, and third portion or lateral portion **710**. The first portion **810** may extend from the first end **852** toward the second end **854**. The second portion **430** may extend away from a bottom surface of the first portion **810** toward the second end **854**. The third portion **710** may also extend away from the bottom surface of the first portion **810** to the second end **854**. The third portion **710** may extend through a central opening **436** of the second portion **430**. The first portion **810** may be made of, for example, a polymer material. The second portion **430** and third portion **710** may be made of, for example, a metal.

[0121] With continued reference to FIGS. **49-54**, the first portion **860** may include an exterior surface **412**, **414**, **416**, **418** and an interior surface, articulating surface, or concave surface **862**. The articulating surface **862** may be positioned on the first end **852** of the glenoid implant **850** and may be, for example, curved or arced into the first portion **860**. More specifically, the articulating surface **860** may have, for example, a cone or spherical articular surface. Further, the articulating surface **860** may have, for example, a hybrid coned and spherical articular surface, as shown in FIG. **52**, enabling conformity with any size humeral head to prevent sliding of the head superiorly. The articulating surface **860** may also include a drive feature including a plurality of engagement members, recesses or notches **864** extending into the exterior surface **412**, **414**, **416**, as shown in FIGS. **49-54**. The engagement members **864** may be positioned circumferentially around the exterior surface **412**, **414**, **416** of the first portion **860**. The engagement members **864** may extend from, for example, a first end **852** through the exterior surface **412**, **414**, **416** to the tapered region **418**. The engagement members **864** may include, for example, chamfered edges. In an embodiment, there may be, for example, four engagement members **864**, although additional numbers of engagement members **864** are also contemplated to provide sufficient grip of the implant **850** to drive the implant **850** into a patient's glenoid. The engagement members **864** may be configured or sized and shaped, for example, to receive a portion of a drive tool for rotating or spinning the implant **850** to drive or screw the implant **850** into the patient's bone. The first rim or distal rim **412**, the second rim or proximal rim **414**, the groove or circumferential channel **416**, and the tapered region or bone contacting surface **418** are as described in greater detail above with reference to implant **400** which will not be described again here for brevity sake. The tapered region **418** may also be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **430**.

[0122] The implant **850** may be inserted into a patient by preparing the glenoid bone to receive the implant **850**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **720** of the stem **712**, a larger hole in the subchondral plate to receive the first segment **714** of the stem **712**, and a prepared

trough to receive the base member **432**. Once the glenoid is prepared, then the implant **850** may be rotated or spun using a tool and the engagement members **864** to advance the implant **850** into the bone. After the implant **850** is seated in the prepared openings, the surgical procedure may be completed.

[0123] Referring now to FIGS. **55-60**, another glenoid implant **900** is shown. The glenoid implant **900** includes a first end or medial end **902** and a second end or lateral end **904**. The first end **902** is positioned opposite the second end **904**. The glenoid implant **900** also includes a first portion or medial portion **410**, a second portion or intermediate portion **910**, and a third portion or lateral portion **710**. The first portion **410** may be as described in greater detail above with respect to implant **400** and which will not be described again here for brevity sake. The second portion **910** may extend away from a bottom surface of the first portion **410** toward the second end **904**. The third portion **710** may be as described in greater detail above with respect to implant **700** and which will not be described again for brevity sake. The third portion **710** may also extend away from the bottom surface of the first portion **410** to the second end **904**. The third portion **710** may extend through a central opening **918** of the second portion **910**. The tapered region **418** of the first portion **410** may be, for example, angled, curved, or arced as it extends between the second rim **414** and the second portion **910**.

[0124] With continued reference to FIGS. **55-60**, the second portion **910** includes a base member or extension member **912** extending away from the tapered region **418** toward the second end **904** of the glenoid implant **900**. The base member **912** may be, for example, a constant or continuous ring extending circumferentially around the bottom of the tapered region **418** of the first portion **410**. The base member **912** may be, for example, configured or sized and shaped to provide improved fixation and support to the glenoid implant **900**. The second portion **910** may also include threads **914** extending circumferentially around the exterior surface of the second portion **910**. The threads **914** may be separated into separate sections by tabs **916**. The separate sections of threads **914** may be, for example, the same size or varying sizes. The tabs **916** may extend out from the base member **912** beyond the exterior surface of the threads **914**. The tabs **916** may be, for example, shaped to have a planar top end and a curved or arced portion extending from the planar top end to the base member **912** of the second portion **910**. The curve or arced portion of the tabs **916** may have, for example, constant radius or a change in radius over the span of the curve or arc. As shown, the base member **912** includes threads **434** extending in the same direction as the threads **718**, **722** of the third portion **710**, however, alternative arrangements of the threads **914** are also contemplated. In addition, the second portion **910** may include a recessed region or opening **918** extending through the second portion **910** and forming an interior surface **920** of the base member **912**. The interior surface **920** is positioned opposite the threads **914** on the base member **912**. The tabs **916** may be, for example, designed to deformably fold as the implant **900** is advanced into the trough in the patient's bone. Once the tabs **916** are deformed, the tabs **916** will assist in preventing the implant **900** from unscrewing.

[0125] The implant **900** may be inserted into a patient by preparing the glenoid bone to receive the implant **900**. The glenoid may be prepared by creating, for example, a smaller hole in the far cortex to receive the second segment **720** of the stem **712**, a larger hole in the subchondral plate to receive the first segment **714** of the stem **712**, and a prepared trough to receive the base member **912**. Once the glenoid is prepared, then the implant **900** may be rotated or spun using a tool and the drive opening **422** to advance the implant **900** into the bone. After the implant **900** is seated in the prepared openings, the surgical procedure may be completed.

[0126] Although not shown, it is also contemplated that the tabs **916** may be placed circumferentially around the exterior surface of the second portion **610**. The tabs **916** may be placed to separate the lips **614**, **616** into separate sections. The separate sections of lips **614**, **616** may be, for example, the same size or varying sizes. The number of tabs **916** and size of the separate sections of lips **614**, **616** may be selected to provide improved fixation and support of the glenoid implant. In another embodiment, the second portion (not shown) may include a plurality of tabs **916** surround an exterior surface of the second portion without any threads or lips.

[0127] The implants **400**, **500**, **550**, **600**, **650**, **700**, **750**, **800**, **850**, **900** may be, for example, a one-piece, non-modular implants **400**, **500**, **550**, **600**, **650**, **700**, **750**, **800**, **850**, **900** that is a hybrid of metal and polymer components to allow for the entire implants **400**, **500**, **550**, **600**, **650**, **700**, **750**, **800**, **850**, **900** to be screwed into a prepared glenoid bone. The implant **800** may be a singular integral or monolithic piece (i.e., of one-piece construction). Alternatively, in some embodiments the implants **400**, **500**, **550**, **600**, **650**, **700**, **750**, **800**, **850**, **900** may be formed from a plurality of components that are coupled (e.g., rigidly coupled) together to form the implants **400**, **500**, **550**, **600**, **650**, **700**, **750**, **800**, **850**, **900**.

[0128] As may be recognized by those of ordinary skill in the art based on the teachings herein, numerous changes and modifications may be made to the above-described and other embodiments of the present disclosure without departing from the scope of the disclosure. The components of the implants, devices, and/or systems as disclosed in the specification, including the accompanying abstract and drawings, may be replaced by alternative component(s) or feature(s), such as those disclosed in another embodiment, which serve the same, equivalent or similar purpose as known by those skilled in the art to achieve the same, equivalent or similar results by such alternative component(s) or feature(s) to provide a similar function for the intended purpose. In addition, the implants, devices, and/or systems may include more or fewer components or features than the embodiments as described and illustrated herein. For example, the components and features of implants **100**, **200**, **300** may be used interchangeably and in alternative combinations as would be modified or altered by one of skill in the art. Further, the steps of the surgical methods associated with the implants **100**, **200**, **300** may be used interchangeably and in alternative combinations as would be modified or altered by one of skill in the art. Accordingly, this detailed description of the currently-preferred embodiments is to be taken in an illustrative, as opposed to limiting of the disclosure.

[0129] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting of the invention. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise.

It will be further understood that the terms "comprise" (and any form of comprise, such as "comprises" and "comprising"), "have" (and any form of have, such as "has", and "having"), "include" (and any form of include, such as "includes" and "including"), and "contain" (and any form of contain, such as "contains" and "containing") are open-ended linking verbs. As a result, a method or device that "comprises," "has," "includes," or "contains" one or more steps or elements possesses those one or more steps or elements, but is not limited to possessing only those one or more steps or elements. Likewise, a step of a method or an element of a device that "comprises," "has," "includes," or "contains" one or more features possesses those one or more features, but is not limited to possessing only those one or more features. Furthermore, a device or structure that is configured in a certain way is configured in at least that way, but may also be configured in ways that are not listed.

[0130] The invention has been described with reference to the preferred embodiments. It will be understood that the operational embodiments described herein are exemplary of a plurality of possible arrangements to provide the same general features, characteristics, and general system operation. Modifications and alterations will occur to others upon a reading and understanding of the preceding detailed description. It is intended that the invention be construed as including all such modifications and alterations.

1. An implant, comprising:

a first portion;

a second portion extending away from a bottom surface of the first portion; and

a third portion extending away from the bottom surface of the first portion, wherein the third portion extends through the second portion, and wherein the third portion includes at least one thread along a length of the third portion.

* * * * *