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**August 26, 2024**

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**APPLICATION NUMBER:** *62/774,402*
**FILING DATE:** *December 3, 2018*

**THE COUNTRY CODE AND NUMBER OF YOUR PRIORITY APPLICATION, TO BE USED FOR FILING ABROAD UNDER THE PARIS CONVENTION, IS US** *62/774,402*

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**Certifying Officer**

PTO/SB/16 (11-08)
Approved for use through 05/31/2015. OMB 0651-0032
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE


## Provisional Application for Patent Cover Sheet

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

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| | |
|---|---|
| **Title of Invention** | Direct pick-up coping system and method for screw attachment of dental prostheses to implants |
| Attorney Docket Number (if applicable) | |

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| The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government. |
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| ◉ No. |
| ○ Yes, the invention was made by an agency of the United States Government. The U.S. Government agency name is: |
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**Applicant asserts small entity status under 37 CFR 1.27 or applicant certifies micro entity status under 37 CFR 1.29**

- (●) Applicant asserts small entity status under 37 CFR 1.27
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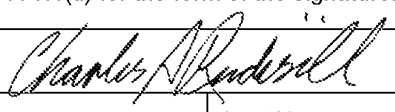
| Signature |  | | | Date (YYYY-MM-DD) | 2018-12-03 |
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# Direct pick-up coping system and method for screw attachment of dental prostheses to implants

## Summary

This disclosure describes an improved system for converting an existing denture appliance for threaded attachment to dental implants. A temporary attachment post engages threads in an abutment to fix a coping to an abutment for cementing to the prosthesis. This temporary attachment post system provides a force holding the coping to the abutment along the same axis as the screw that is used to finally retain the converted prosthesis to the abutment. After cementing, the prothesis with the coping is separated from the post axially, the post is removed from the abutment threads, the prosthesis is prepared to receive a retaining screw for attachment.

## Background

Current methods of converting a denture into a temporary appliance after dental implants involve relatively complicated interference-fit ball and sockets, and other methods that may be difficult to both install in the denture and difficulty in installing and removal from the patient. These snap-on systems, and other prior art systems and methods that allow the use of a screw-on appliance are also relatively invasive to the denture, decreasing its strength and frequently resulting in mechanical failure of the denture. Snap-on attachment abutments and copings are generally larger than their screw-on counterparts. Conventional methods of converting an existing appliance for screw attachment require the appliance to act as an open impression tray for impression coping systems and long processing screws that extend through holes in the appliance in order to have access to the screws following cementing. These conventional impression copings may require extensive work to adjust their height.

Problems addressed and improved by the inventive concepts may include one or more of the following:

a) more simple installation than available methods and parts
b) less expensive and less complicated mechanical parts
c) less destructive to the appliance, resulting in less failure and stronger appliance
d) easily installed and removed with conventional screws versus various snap-on systems
e) mating tolerances of the appliance and implants are more accommodating than current methods.
f) prostheses may be modified and installed in a patient during a single office visit
g) fewer restrictions on implant spacing and parallelism
h) increased patient comfort especially in immediate placement after implant surgery

For example, in FIG.1 and FIG. 2, a schematic isometric view of a denture is shown (tooth side 2 and gum side 3). In prior-art methods, a large hole 4 must be drilled into the denture in order to place a coping for attachment to the abutment. Since the denture typically must be placed over multiple relatively long prior art systems, lack of parallelism in implant axes generally results in larger clearance holes in the denture; prior-art copings also have large outside-diameters that require large diameter holes to be drilled through the denture. FIG. 3 shows a typical implant 7 and screw-in straight abutment 8. The disclosed inventive concepts allow drilling of a smaller, accurately positioned blind hole 5 for the coping 9, along with a very small hole 6 for the screw used to attach the appliance to the abutment 8.

Some embodiments of the invention include a screw-in fastener system used to temporarily retain a coping on an abutment during cementing of the coping into a blind hole located in the gum-side of the denture appliance. The temporary fastener system disclosed has features to allow easy removal of the denture from the fastener post after cementing of the coping into the denture is complete, without the need for tools or access to the fastener system to unscrew it. Some embodiments include a temporary fastener with a male-threaded bottom portion that is installed into standard abutments (various styles and systems of abutments and implants are commercially available), and a top portion, or cap feature, of the fastener that retains a coping onto an abutment, and the fastener having a separable portion to allow removal of the denture appliance without requiring mechanical access to the fastener. The inventive concepts disclosed facilitate easier installation and removal on multiple abutments that may be oriented at multiple compound angles.

**Detailed Description of Various Embodiments of the Invention and Figures**

FIG. 4 shows an exploded view 12 of parts used in an embodiment of the subject invention. Components of this embodiment include a temporary aligning and retaining screw/post 10 and axially movable cap 11. Cap 11 and temporary attachment post 10 are constructed such that cap 11 is free to move axially, with a controlled amount of friction, or retention force.

The cap 11 temporarily retains coping 9 onto abutment 8 with a force aligned directly along the same axis as the semi-permanent screw during the cementing process of the coping into the denture 1. The portion of the post engaging the abutment threads also prevents any cement from contacting the abutment screw threads. After the coping is cemented into the denture, the temporary attachment post is able to be extracted from the coping/cap/denture assembly. An example

installation process is described in FIG. 16 through FIG. 31 and will be discussed later in this text.

FIG. 5 through FIG. 9 show example cross-sectional views of some of the different stages of installation of the temporary fastener system into a denture. FIG. 5 shows the stage of the installation process after the coping 9 has been cemented with cement 71 into drilled recess 5 (prior steps not illustrated would include marking of the drilled recess 5, machining of recess 5, etc.). Fig 6 shows the temporary attachment post 10 extracted from cap 11 as the coping 9 is picked-up with the denture 1. Temporary attachment post 10 is subsequently removed from the abutment 8. FIG. 7 and FIG. 8 show subsequent steps of drilling a pilot hole with drill 72 from the coping-side, and enlargement of the pilot hole with drill 73 to form a clearance-hole 74 for mounting screw 75 from the tooth-side of the denture to accommodate mounting screw 75. FIG. 9 shows the denture mounted to abutment 8 with mounting screw 75.

The axial movement ability between the cap and temporary attachment post allows removal of the temporary attachment post from the cap without tools while also retaining the coping onto the abutment during installation and cementing of the coping into the denture. These parts are accurately aligned during the cementing process since the temporary post engages the abutment threads to provide an axial force holding the coping to the abutment just like the screw used for final attachment. The screw driving torque function may be accomplished in a number of methods, including a press-fit of the cap to a cylindrical top portion of the temporary attachment post, or engagement with features on the temporary attachment post such as square, hex or spline features. The retention/axial force of the cap to the temporary attachment post may be determined by the degree of press-fit and frictional properties between the cap and temporary attachment post, and/or spring features incorporated into the temporary attachment post and/or cap. FIG. 28 through FIG. 30 show a square cross-

section on the top of the temporary attachment post that engages a mating square feature in the cap 11. The cap may have an amount of press-fit/interference to the temporary attachment post to provide an axial retention force of approximately 20 to 900 grams, this force being sufficient to retain coping 9 during assembly while allowing relatively easy pickup removal of the coping and denture assembly from the temporary attachment post(s) after assembly. The temporary attachment post 10 may include indicators (not shown) in the end by the cap 11 to provide intermediate visual and/or tactile feedback on the depth of threaded engagement of the post during attachment of the coping to the abutment beyond the larger relative position change in axial position of the cap on the post shown between FIG. 29 and FIG. 30.

In this embodiment, screw driving torque is provided by the square cross-section of the cap aperture and temporary attachment post; if the temporary attachment post top portion were cylindrical (FIG. 31), driving torque would be provided by the friction of the press-fit between the cap and temporary attachment post. For example, a medium press-fit of a 3mm diameter 1 mm thick nylon cap onto a 1.3mm diameter stainless steel cylindrical rod may produce approximately 500 grams of axial retention force and 17 gram-cm driving torque. A typical screw thread size for appliances is m1.4 x 0.3.

Other methods of providing the axial force, in addition to interference-fit of the cap to the temporary attachment post would be the use of spring features in the temporary attachment post as shown in the slotted temporary attachment post of FIG. 32, and/or spring features 25 incorporated into a spring-cap 24 as shown in FIG. 35, and FIG. 47 through FIG. 49. FIG. 48 and FIG. 49 show possible designs of flexure beam features 53 and 54 of FIGS. 48 and 49 respectively. These spring features may be molded or formed into polymer or metal parts or stamped or etched from thin metallic materials. FIG. 47 shows a split-collar feature 51 on cap 50 which presses onto the temporary attachment post. Various

features such as symmetric axial splines (FIG.33), asymmetric splines or groves, and textures may also be used to tailor driving torque and axial retention force of the cap to the temporary attachment post. Non-symmetric features may also be utilized to tailor different installation torque and extraction forces. Surface finish and coefficients of friction of the mating materials may also be used to control the driving and retention properties.

FIG. 10 and FIG. 11 show some characteristic dimensions of dental abutments and copings for an embodiment that has been fabricated and used in field trials.

FIGS. 12 through 27 show schematic isometric views of typical installation steps for an embodiment, expanding on the cross-section views of FIG. 5 through FIG. 9.

The following describes the installation process of an exemplary embodiment of FIG. 12 to FIG. 27. In FIG. 12, a schematic isometric view of a portion of the patient's jaw 22 is shown with an implant 70 (not shown) installed, and abutment 8 installed into the implant. The coping 9 is placed onto the abutment 8, the top portion of temporary attachment post 10 is assembled onto cap 11. The top portion of temporary attachment post 10 and cap 11 are configured such that there is a means to drive the temporary attachment post into the abutment, while allowing axial movement of the cap 11 relative to the temporary attachment post axis, the cap/temporary attachment post interface having sufficient retention force to keep the coping in place on the abutment during subsequent installation steps, and the temporary attachment post being removable after cementing the coping into the denture. Cap 11 may be attached to a break-away installation/removal tool 18.

FIG. 13 shows the coping 9 placed on the abutment 8 (the coping-abutment surfaces typically comprising a conical or spherical concave feature on the

coping 9 that mates with a complementary feature on the top of the abutment 8), and the cap/tool 18 installed onto temporary attachment post 10.

FIG. 14 shows the temporary attachment post being threaded into the abutment 8, through a clearance hole in the coping 9. The cap abuts the coping to secure the coping to the abutment. The cap 11 is free to move axially along the temporary attachment post with a frictional retaining force of the cap to the temporary attachment post. A known amount of retention force of the coping to abutment is provided by the design and materials used in the cap and temporary attachment post.

FIG. 15 shows the tool portion of the cap being removed; the tool may be used for removal of the temporary attachment post at a later step.

FIG. 50 through FIG. 55 show additional embodiments and details of an installation and removal tool and method.

FIG. 16 shows marking of the position of the coping onto the denture appliance for drilling a recess for the coping in the denture.

FIG. 17 shows the denture marked 23 with the coping drilling location.

FIG. 18 shows the denture after drilling the cavity for the coping; the cavity for the coping may be accurately drilled slightly larger than the coping, without significant unwanted material removal from the denture.

FIG. 19 shows cement being applied to the coping and/or denture after confirmation of freedom to provide proper occlusion during dry testing. Although not illustrated, the cavity of the denture or the coping may optionally include features to provide venting of excess cement if desired.

FIG. 20 shows the coping being cemented into the denture

FIG. 21 shows the denture removed from the temporary attachment post; the temporary attachment post/cap design allows removal of the denture from the temporary attachment post. The coping is now cemented into the denture.

FIG. 22 shows the temporary attachment post being removed with the tool portion of the cap.

FIG. 23 shows the abutment installed in the implant with the temporary attachment post removed.

FIG. 24 shows drilling a small guide-hole (for example 1-2 mm diameter), through the clearance hole of the coping, into and through the denture. This guide hole provides a small reference hole for enlargement of the hole to accommodate the denture retaining screw.

FIG. 25 shows enlarging the guide hole to a clearance hole for denture retaining screw, approximately the diameter of the head of the retaining screw (e.g. 1.5-2.5mm). The clearance hole would typically be drilled down to the top surface of the coping.

FIG. 26 shows the denture being installed onto the implant abutment by placing the denture coping onto the abutment, and installing the denture retaining screw.

FIG. 27 shows the assembled denture on the implant. The holes in the denture may be filled with gutta percha and color-matching composite materials for aesthetic purposes.

FIG. 28 is another exploded isometric view of parts of an embodiment of the invention. In this example, cap 11 is integrated into a breakaway installation tool 18, tool 18 having a breakaway drive and removal section 19 also comprising a drive feature 21 for removal of temporary attachment post 10. The tool portion 19 may be used to install the temporary attachment post 10, and then section 19 broken away at mechanically weak separation feature 20, for example, when the post bottoms out in the abutment leaving the cap portion 11 in position. One or both ends of the tool may be shaped to subsequently engage and remove the temporary attachment post 10 after installation of coping 9 into the denture.

FIG. 36 shows a temporary attachment post that includes an integral cap and a waist section designed to yield under axial force during the pick-up process after cementing.

FIG. 37 shows an embodiment of a one-piece temporary attachment post 58 and cap with a break-away cap 60 molded onto temporary attachment post with threads 62 and drive-hex feature 61, and small break-away tabs 59 designed to yield under axial force after the denture cementing step.

Note from the above description of the embodiments that minimal material is removed from the denture to create the blind hole to provide a screw-on fastening of the denture compared to the larger through holes necessary for wider and longer prior art systems. This provides a more intact and stronger denture. The process is very simple with no special additional custom tools required for installation of the parts. The denture is easy to remove, since there are no interference parts as in snap-on systems, and no special tools are required for removal/installation onto the implants. The installation process is fast and non-complicated such that a modified denture may be provided in one visit.

Temporary attachment posts and caps may be made from metal and polymer materials such as titanium, stainless steels, nylon and PEEK and other non-corrosive biocompatible materials.

If additional off-axis accommodation is desired when extracting the temporary attachment post from the coping after cementing, some flexibility may be incorporated into the temporary attachment post, such as the necked down portion of the temporary attachment post shown in FIG. 34, which allows the temporary attachment post to flex slightly off-axis during the pick-up process. Note that this alignment flexibility will generally not be required during the final screw attachment process since the coping can be seated on the abutment before the semi-permanent attachment screw is inserted. Other means for providing off-axis movement are shown in FIG. 38, which includes rounded portion 27 of temporary attachment post 25 that engages cap 26. FIG. 39 shows a tapered or rounded portion 29 of cap 30. FIG. 40 shows a thin retaining ring 32 that engages temporary attachment post 31. The retaining ring 32 also provides a one-way insertion direction of temporary attachment post 31. FIG. 41 shows a thin retainer 35 that may be comprised of a metallic or polymer sheet attached to the top portion of temporary attachment post 33; sheet 35 may be attached to temporary attachment post 33 using adhesives, plastic or metal welding, etc.

In actual trial installations, polymer caps of approximately 1.2 mm thickness press fit onto posts of approximately 1.4 diameter with simple axial holes have been sufficient for installation and removal from multiple axially divergent abutments.

FIG. 42 shows a compliant portion 37 incorporated into the temporary attachment post 39 shaft or cap. Compliant portion 37 may be for example an elastomeric material; compliant portion 37 may also function as the separable

interface with controlled axial breakaway force. Other methods of separating a compliant portion may include exposure of compliant portion 37 made from a material easily affected by to heat, any wavelength of electromagnetic energy, or chemical reaction that may be applied externally or as part of the cementing process.

The invention is not restricted to a temporary attachment post with standard screw threads that engage the abutment through rotation. For example, alternate separable temporary attachment posts embodiments are possible providing features that allow the post to removably hold the coping to the abutment by other means than a separable cap. For example, as shown in FIG. 43 a fastener 39 may contain a separable threaded or serrated portion 30 that engages the screw threads in the abutment for cementing, but that will release with axial force after. FIG. 43 shows a temporary attachment post 39 having a slot 41 and asymmetric threads or serrations 40 that allow the temporary attachment post to be inserted through rotation for alignment for coping pick-up but may be subsequently extracted with a separation force in the axial direction.

FIG. 44 shows an embodiment where axial flexibility and/or controlled retention between cap 44 and temporary attachment post 43 is provided by an interface material 45 such as adhesives, silicones, and elastomeric materials. FIG. 45 shows cap 47 retained with o-ring feature 38 to temporary attachment post 46. FIG. 46 shows a cup-shaped interface material between temporary attachment post 43 and cap 44.

Any of the embodiments may contain a film or deposited material on top of the cap and temporary attachment post to prevent adhesion to the temporary attachment post of cement or other materials used for installation, as shown in the film 56 of FIG. 39.

Temporary attachment posts may be rotationally driven into the abutment threads using either the cap or the temporary attachment post itself. Temporary attachment posts and caps may have varied drive features such as male or female knurls, hex, spines, spanner notches/holes. These design alternatives are driven by functional requirements of a particular implementation.

Other means of attaching/joining a secondary separable portion include insert-molding, use of adhesives, waxes, solders or other metallic materials, heat-staking, and ultrasonic bonding.

Break-away portions may also be formed by two-shot molding, dispensing or otherwise placing a secondary mechanically, thermally, or electromagnetically fusible material on a portion of the fastener to provide the break-away function.

Thin-film or thick-film metallic and polymer coatings may be applied to portions of the fastener to tailor friction and insertion and extraction forces, enhance adhesion of cements, and other properties such as corrosion-resistance.

Holes for screw access as referred to in FIG. 7 and FIG. 8, Fig 24 and FIG. 25 may be drilled using various drills and guide methods. Pilot hole drills may be of varied designs such as reduced-point pilot drills, core-drills, hollow annular drills. Drill-guides and bushings may also be used to aid in angular alignment and registration of the drilled holes. For example, a hollow drill guide that fits in the coping taper may be used to assist in guiding the drill for the first pilot hole (FIG. 24). For drilling of the enlarged screw-access hole (FIG. 25), a guide rod may be inserted into the first drilled hole, and a hollow core-drill placed over the guide rod. In actual testing of the described methods, a simple twist drill for drilling of the first guide hole, and a twist drill with a pilot section on the end that fits into the first guide hole has provided satisfactory alignment and results without the need for additional guides, fixtures and drill varieties. Density or color differences

between the coping and cap nut may be used to provide feedback for free-hand drilling.

Simple tools for installation and removal of the temporary attachment post and coping include the embodiment shown in FIG. 50-FIG. 55. As shown, tool 64 includes a concave hex socket 68 that fits temporary post nut 63, and coping retaining portion 69 that retains coping 61 with a slight interference fit. Thus, as shown in FIG. 51, the temporary post nut 63 with post 62 is engaged with the socket portion of the tool, and the coping 61 is retained in the tool. The coping is threaded onto the abutment 60 using the hex portion of the driver engaging the nut. The tool may also have an integrated feature for removing the post, such as the opposite taper-fit end feature 70 shown in FIG. 54 and FIG. 55. FIG. 50 illustrates undercut 67 and anti-rotation flats 65 incorporated into the coping.

It is understood that the concept of the temporary attachment of the coping with the abutment with an axially separable temporary post is not dependent upon having a separate cap 11 or nut 63 on the post. If desired the cap or nut can be eliminated and the coping may be directly fixed and axially separable from the temporary attachment post. The mechanical interface between the coping and post may be tailored to provide rotational engagement and relative axial movement above a designed minimum axial force.

Example embodiments of the coping and post being the separable components include the following:

FIG. 56 shows temporary attachment post 71, engaging an interference fit of coping 72 at a general location denoted by the arrow “I”. Metal, metal-reinforced, ceramic, and polymer copings, posts and fasteners may be included in this and other embodiments. Any of the parts may have surface treatments to control friction or adhesion.

FIG. 57 shows temporary attachment post 71 engaging integral spring-finger features 78 of coping 73.

FIG. 58 shows a temporary attachment post 71 engaging collet-type spring fingers 77 of coping 74, these collet-type features may be formed using slots in the coping 74.

FIG. 59 shows a slotted spring feature 79 formed in the temporary attachment post 76. The spring-features engage a portion of the coping 75, as shown at the arrow location “S”. Such features may be of varied shapes including slots, eyelets, swaged portions, tubular swaged parts, etc. A film 56 (not shown) may be used to prevent the ingress of cement into any voids at the top of the post/coping assembly similar to that shown in FIG. 39.

FIG. 60 shows temporary attachment post 71 and coping 75 engaged using an o-ring or washer-type component 80. Such washers may be elastomers, polymers, metals, etc. and may be forms in varied shapes, such as the u-shaped retainer 81 of FIG. 61.

FIG. 62 shows temporary attachment post 71 retained to coping 75 using a cap feature 82. Cap feature 82 may be a tape, or other polymers or metals joined using adhesives, thermal and ultrasonic bonding, welding, and brazing, etc.

FIG. 62 shows temporary attachment post 71 retained using a filler material 83 in the counterbore of coping 75. Fillers may include a variety of polymer adhesives or fillers, such as silicones, acrylics, epoxies, and/or soft metallic materials.

Installation of these embodiments may also be accomplished with simple polymer or metal tools 84, for example, as shown in FIG. 63 that engage the flats or other features of the coping 75, and/or of features on top of the threaded post.

Although the descriptions above use rotational engagement of the bottom of the post with internal threads of the abutment as a preferred approach, this is not meant to be limiting. Alternate approaches for engaging a temporary attachment post with abutment threads through axial insertion without rotation are considered to be part of this disclosure. For example, the split post bottom structure shown in FIG. 43 which allows axial extraction can also be used for axial insertion. Similarly, an interference fit between the bottom of the post with the threads may also be designed to provide sufficient engagement to provide adequate alignment and fixing of the coping for the pick-up cementing process described earlier. For non-rotary extraction of the post, it is not necessary to have the extraction force of the post-abutment thread interface greater than the force required for relative movement of the coping or cap with the upper end of the post. That is, if the temporary attachment post remains fixed to the coping during the pick-up step, the post can be removed from the dental appliance after removal from the patient's mouth.

Although axially symmetric interfaces between coping and abutment have been described, the inventive concepts may also be applied to asymmetric abutments and copings.

Although the system is described in detail for converting an existing denture, the parts and methods may be adapted for use with individual crowns or other existing or new prostheses.

Various embodiments have been described to illustrate the disclosed inventive concepts, not to limit the invention. Combining inventive elements of one or

more of the embodiments with known materials, components and techniques in dental science to create further embodiments using the inventive concepts is considered to be part of this disclosure.

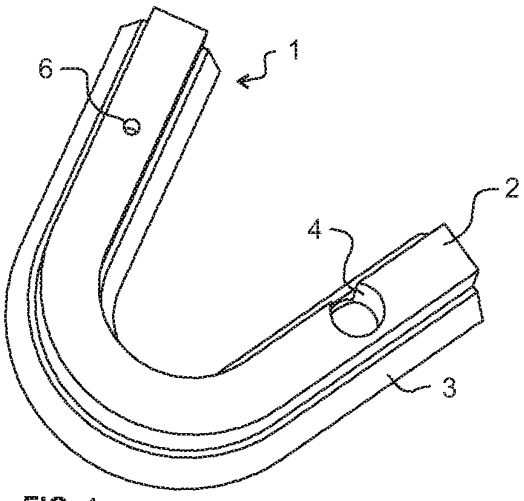


FIG. 1

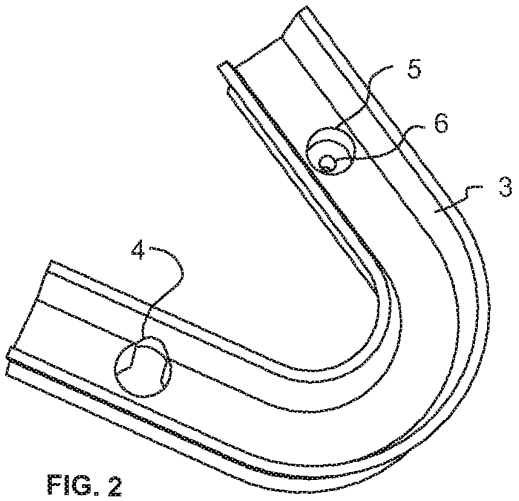


FIG. 2

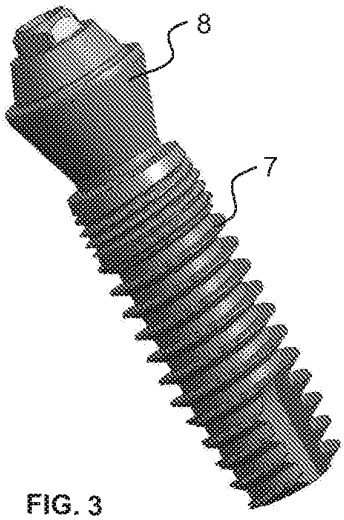


FIG. 3

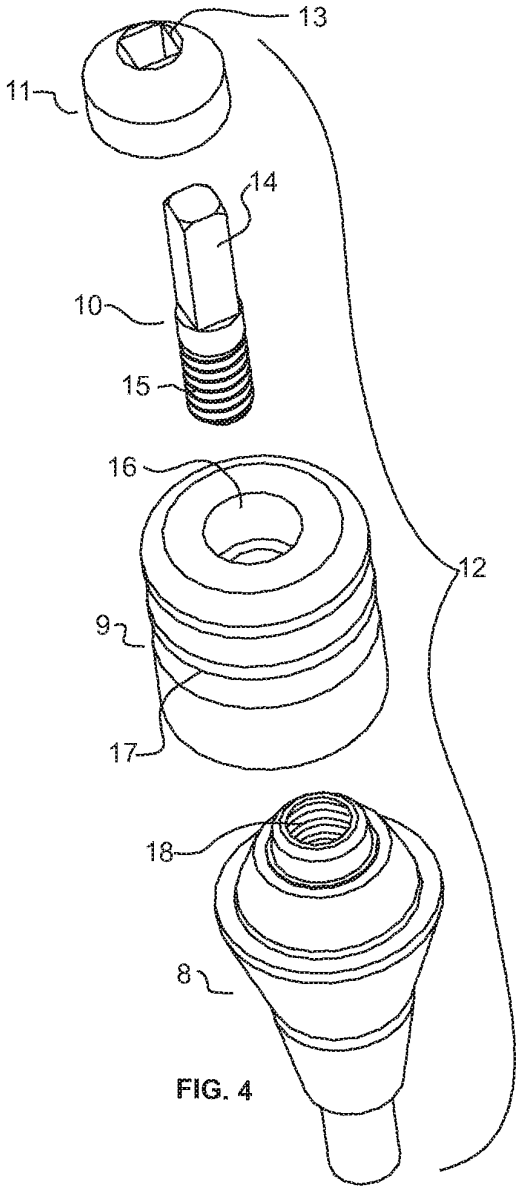


FIG. 4

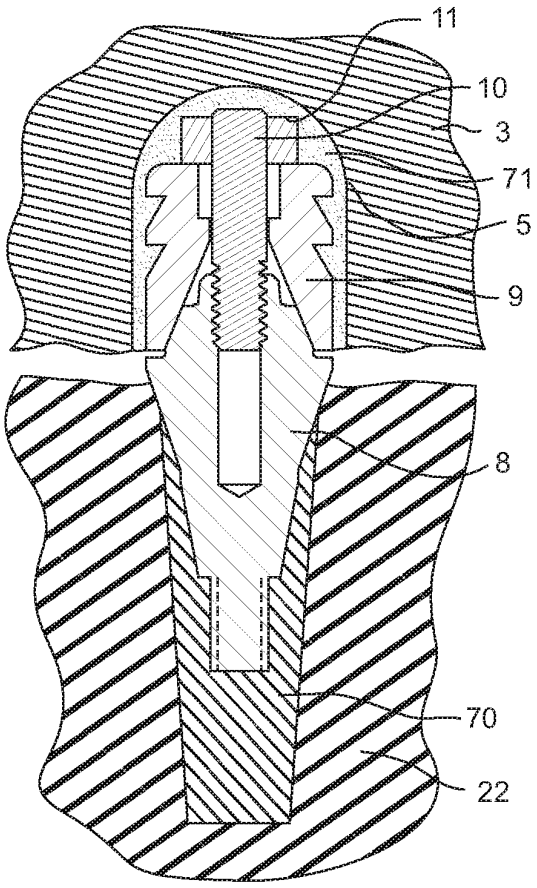


FIG. 5

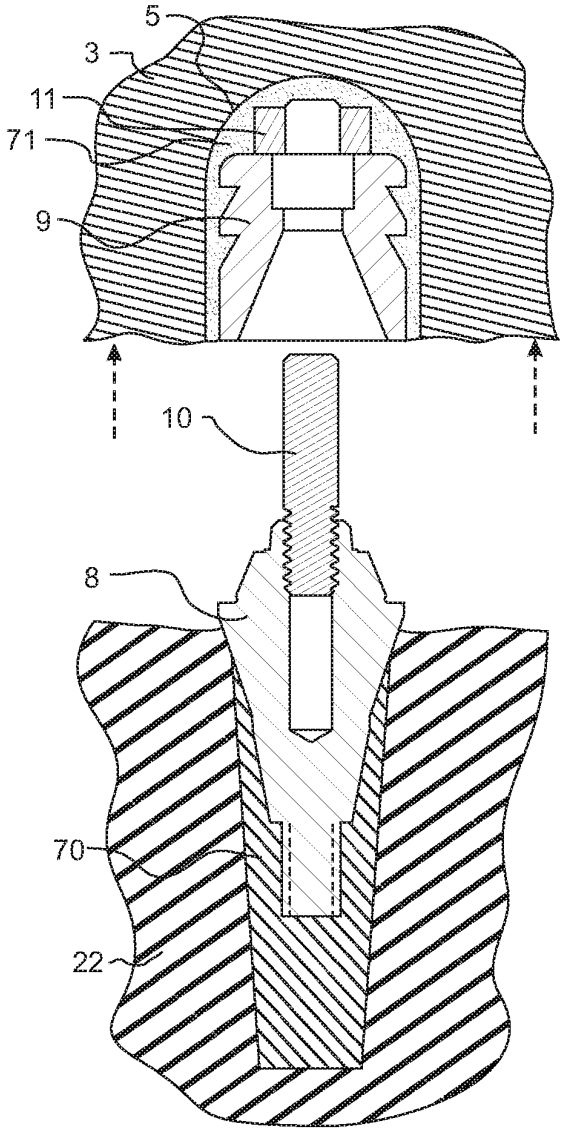


FIG. 6

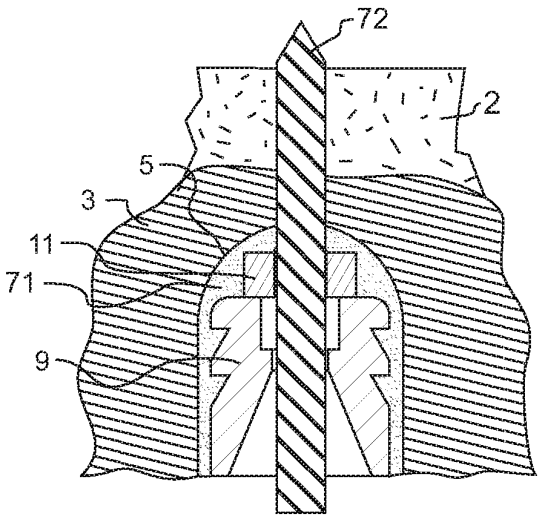


FIG. 7

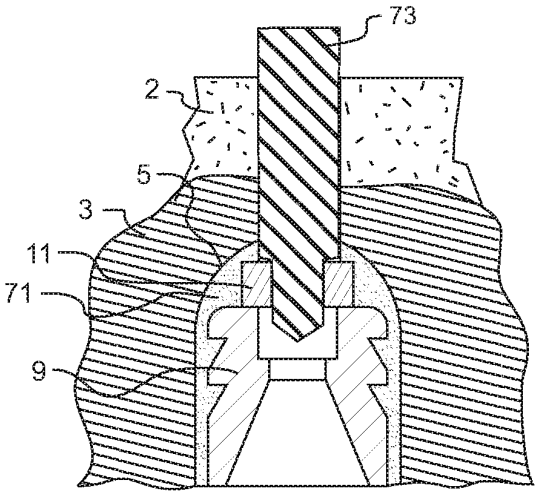


FIG. 8

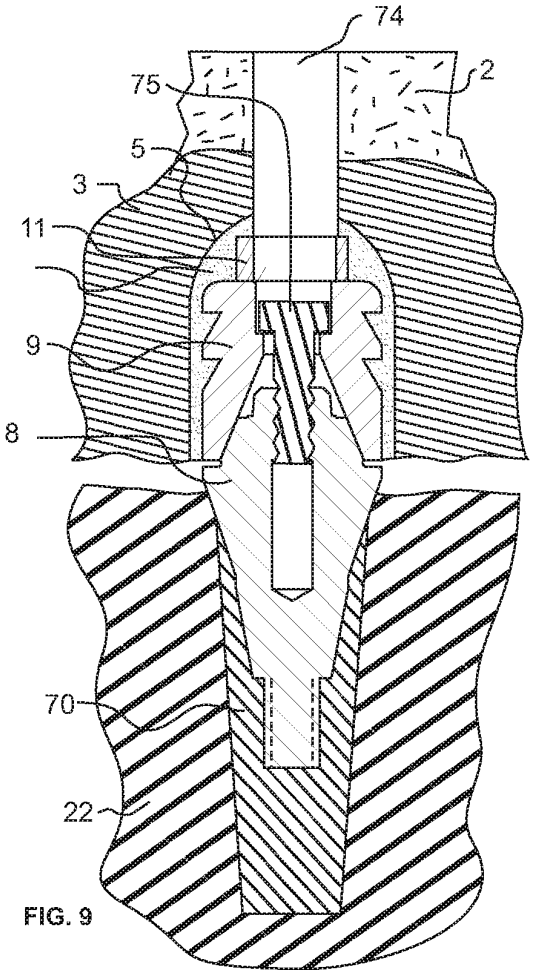


FIG. 9

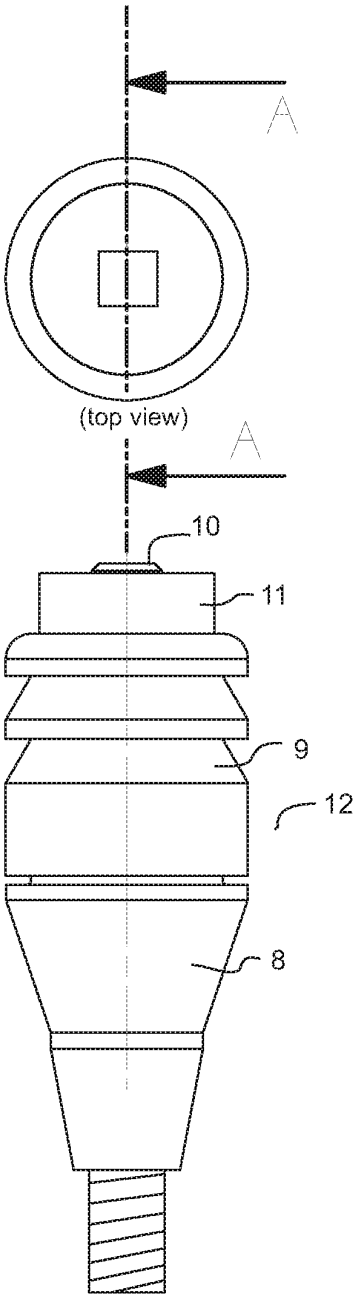


FIG. 10

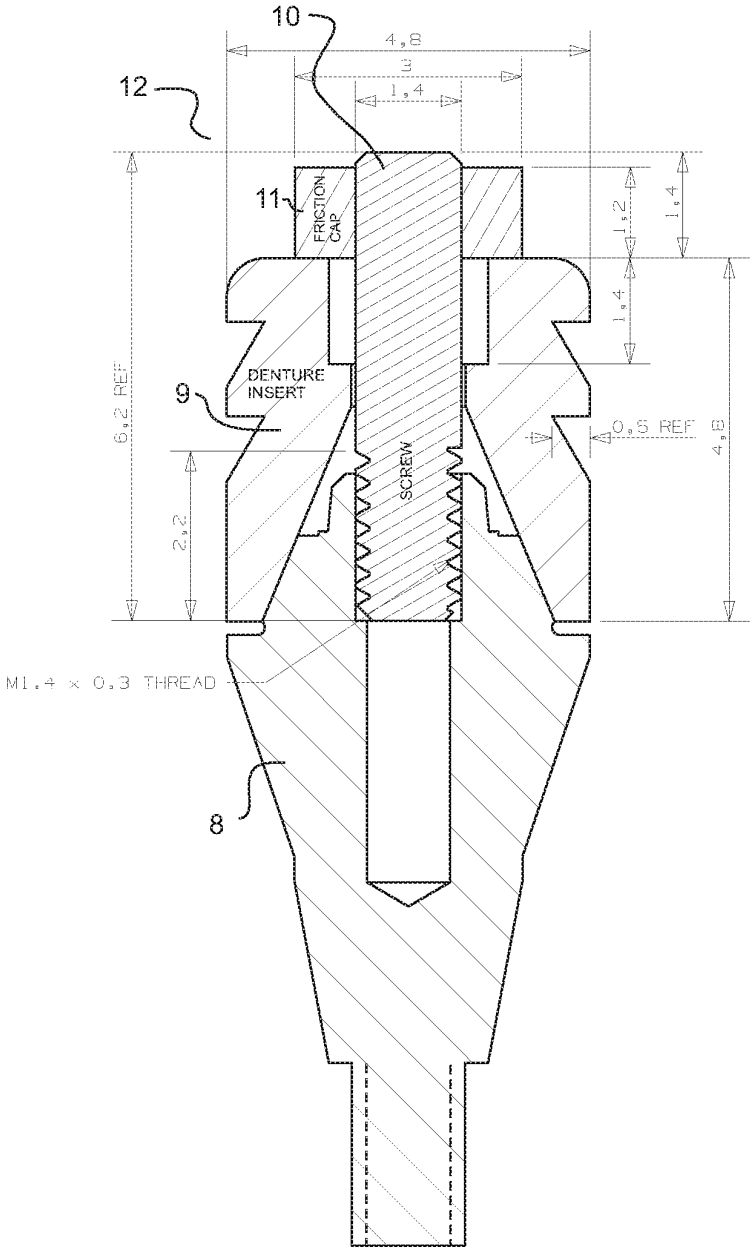


FIG. 11
(section A-A of FIG. 10)

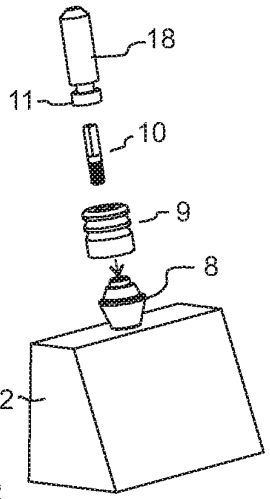


FIG. 12
install insert onto abutment prior to marking denture

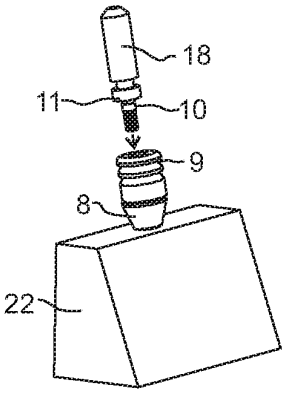


FIG. 13
assemble tool/cap to temp attachment post, assemble insert to abutment

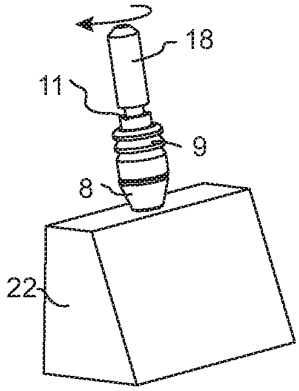


FIG. 14
drive temp attachment post and cap to secure insert to abutment

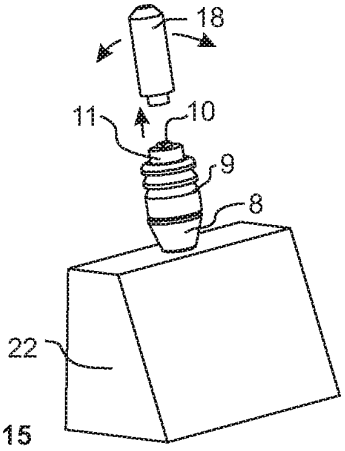


FIG. 15
break-away tool from cap

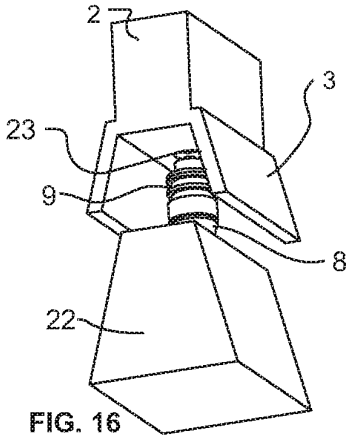


FIG. 16
mark denture for drilling for insert

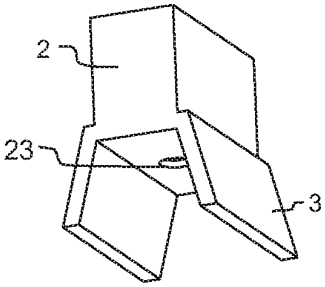


FIG. 17
denture marked for insert drilling

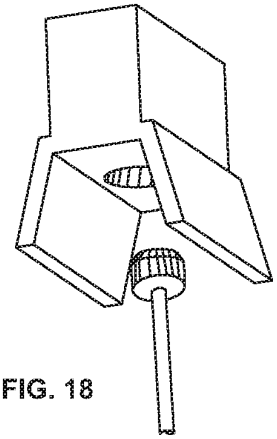

FIG. 18
drill recess for insert (blind hole)

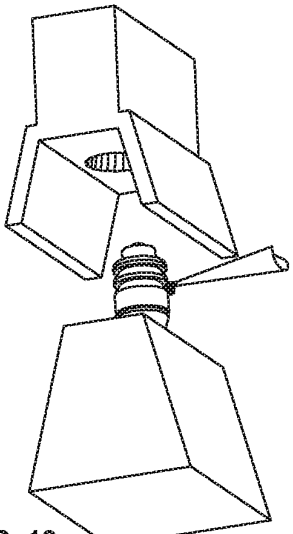

FIG. 19
apply adhesive to insert and/or denture cavity

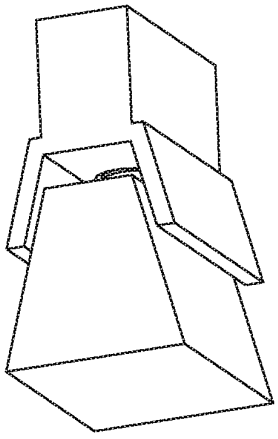

FIG. 20
seat and cure insert and adhesive

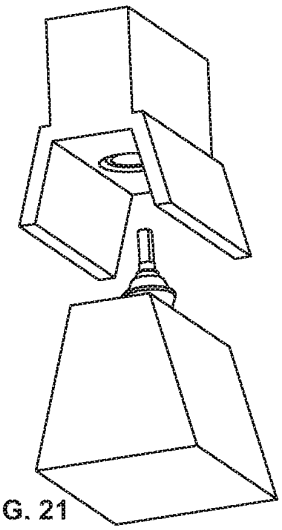

FIG. 21

insert cemented into denture, denture removed from temp attachment post

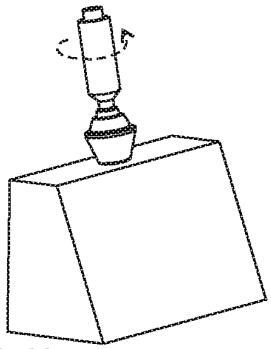

FIG. 22

remove temp attachment post from abutment using tool

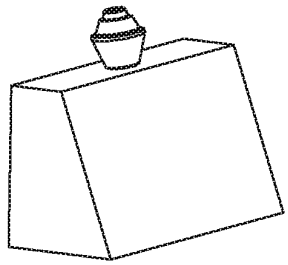

FIG. 23

temp attachment post removed from abutment

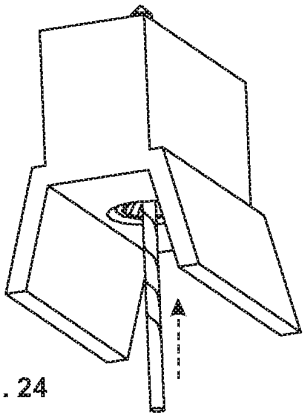

FIG. 24

drill small dia. guide/pilot hole for denture attachment screw

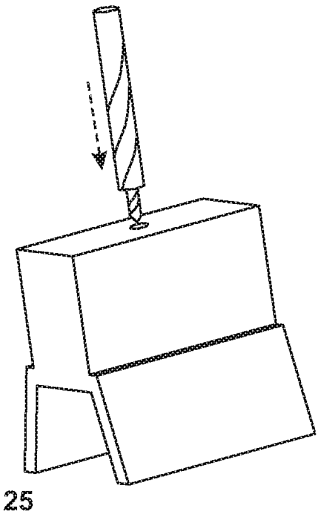

FIG. 25

drill clearance hole for denture attachment screw

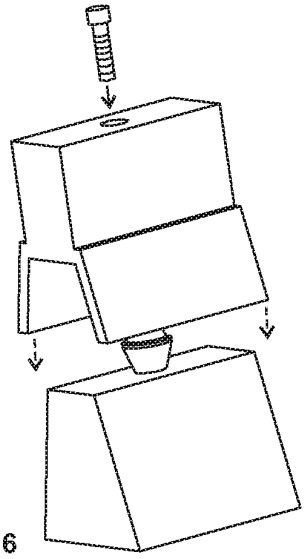

FIG. 26

install denture onto abutment using denture attachment screw

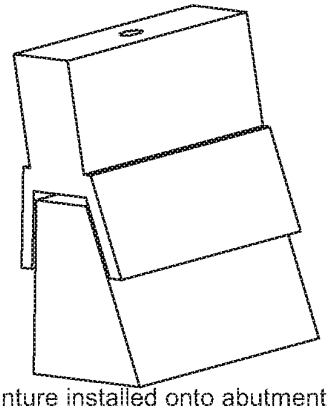

FIG. 27

denture installed onto abutment using attachment screw

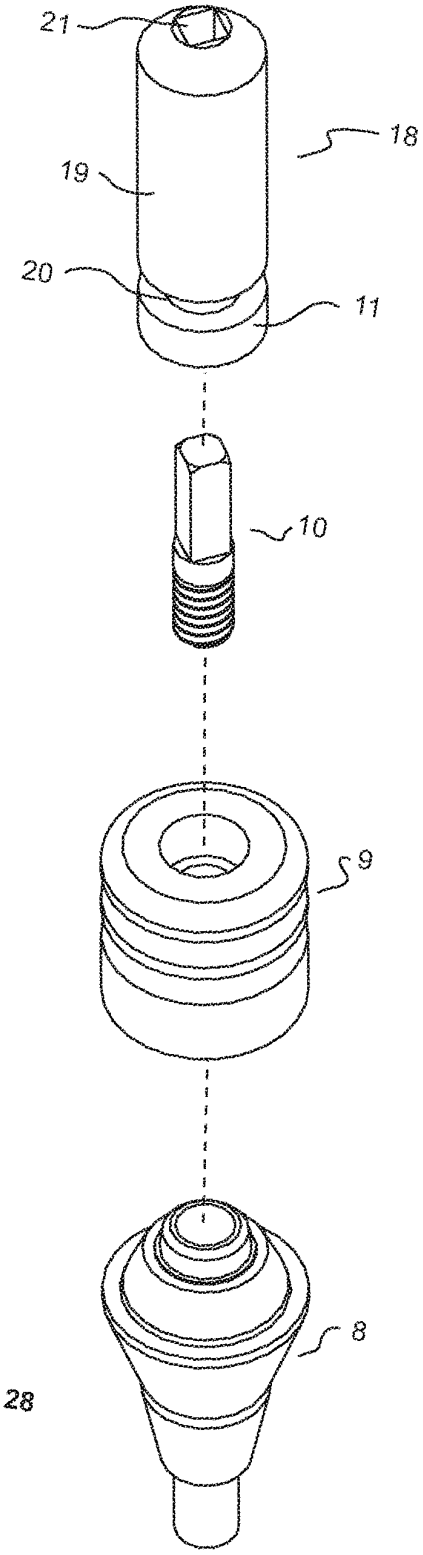


FIG. 28

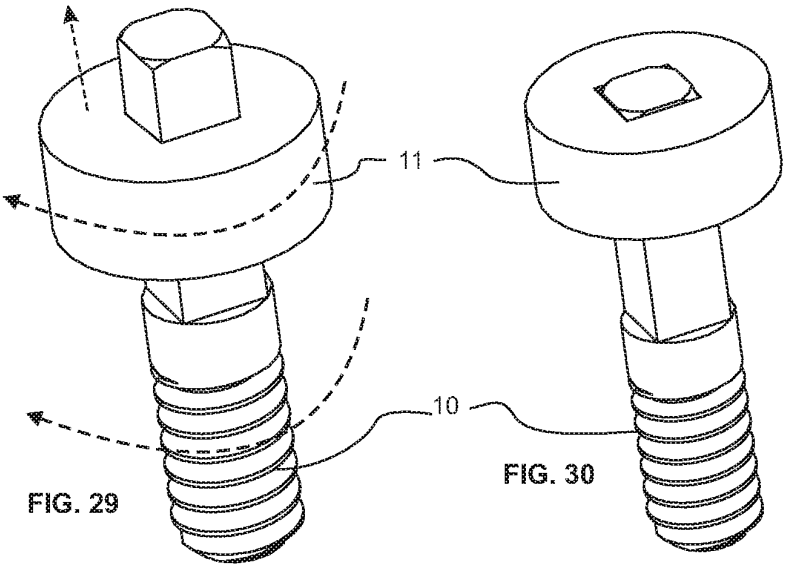


FIG. 29

FIG. 30

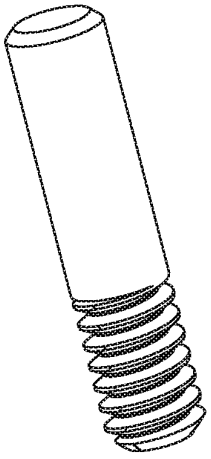

FIG. 31

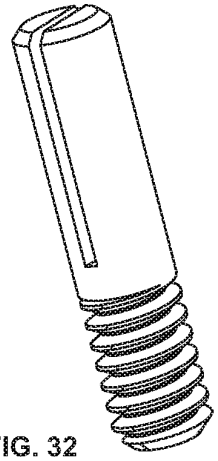

FIG. 32

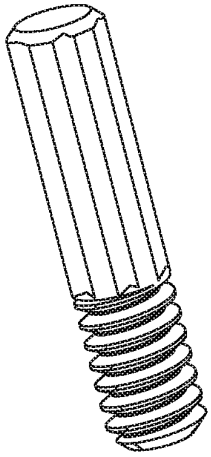

FIG. 33

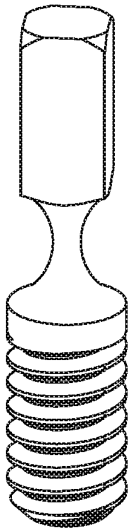

FIG. 34

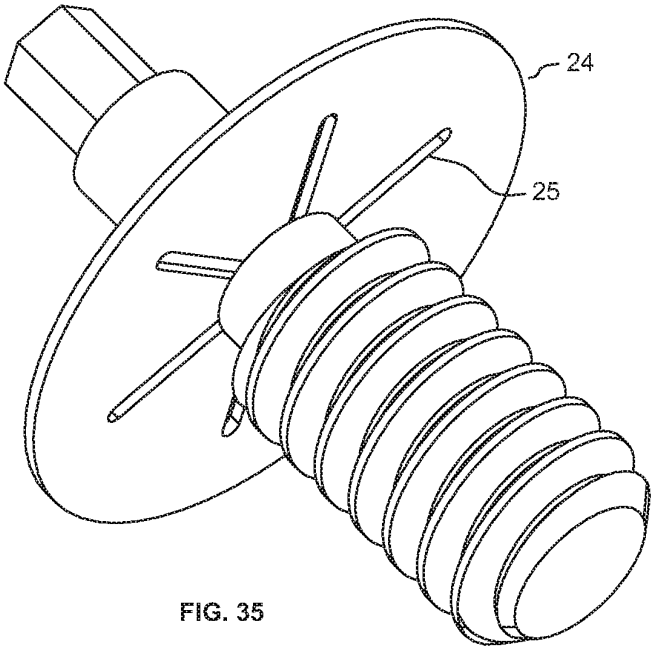


FIG. 35

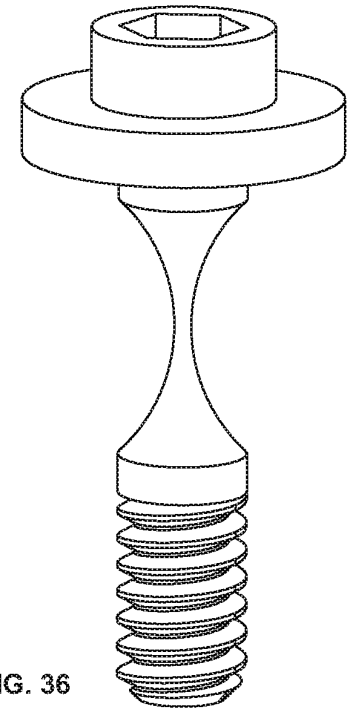

FIG. 36

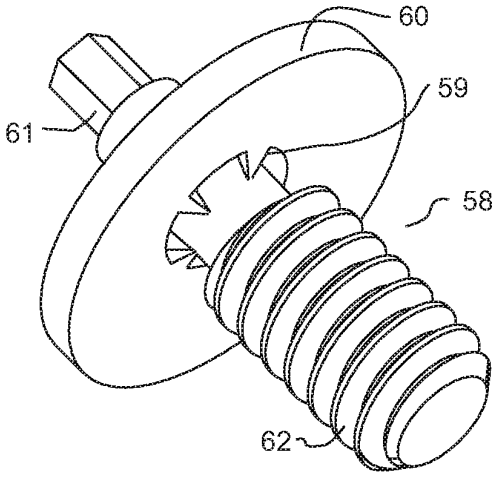


FIG. 37

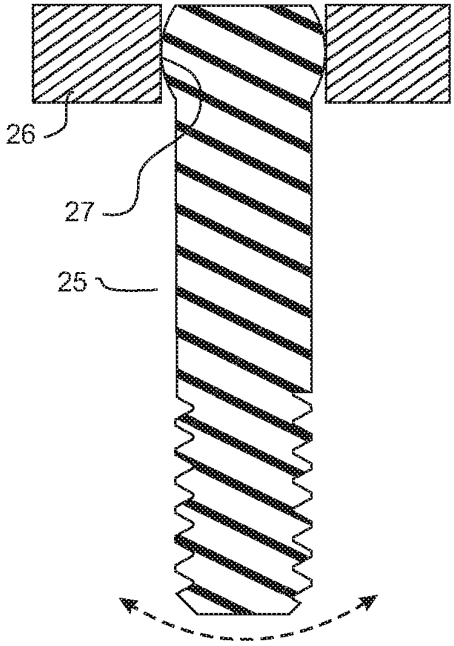


FIG. 38

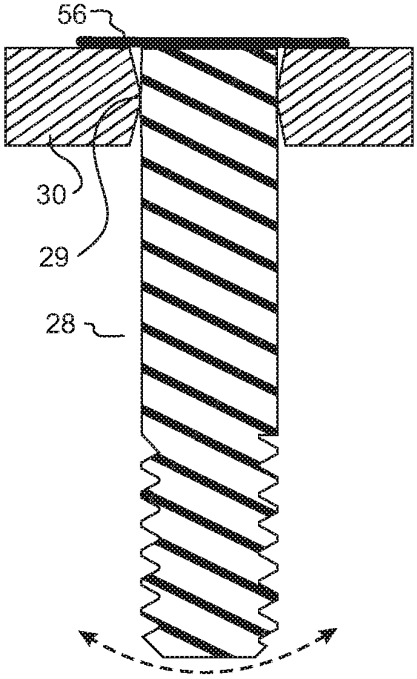


FIG. 39

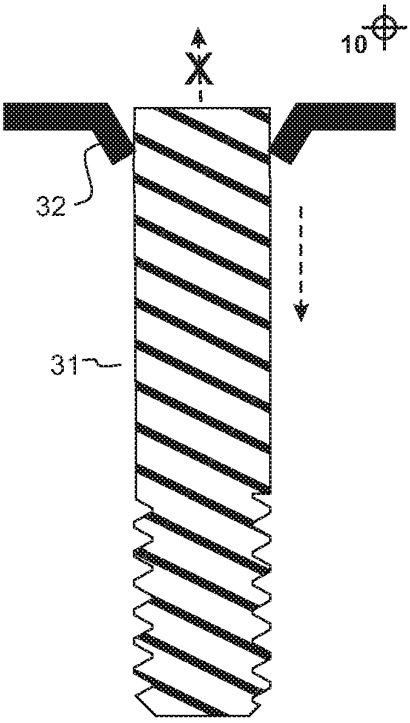


FIG. 40

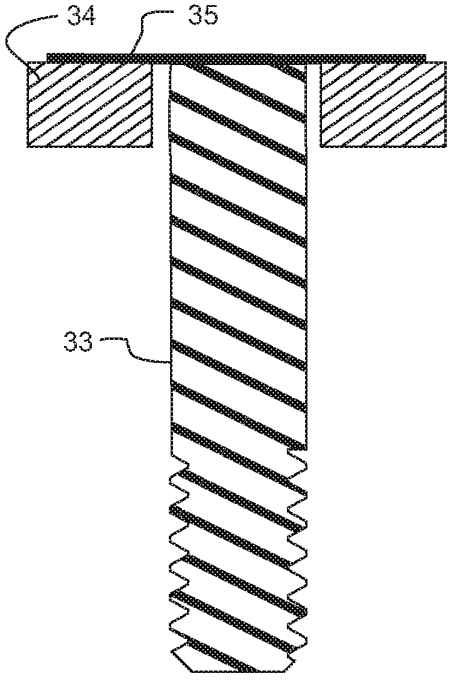


FIG. 41

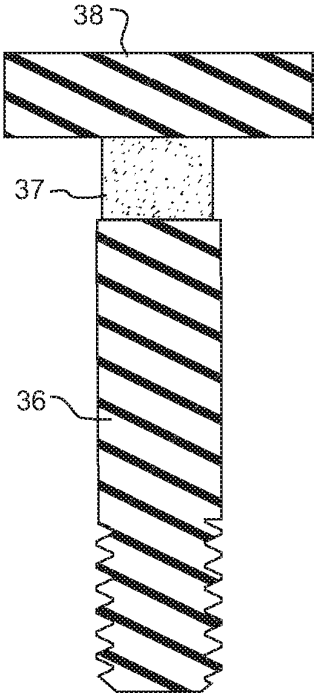


FIG. 42

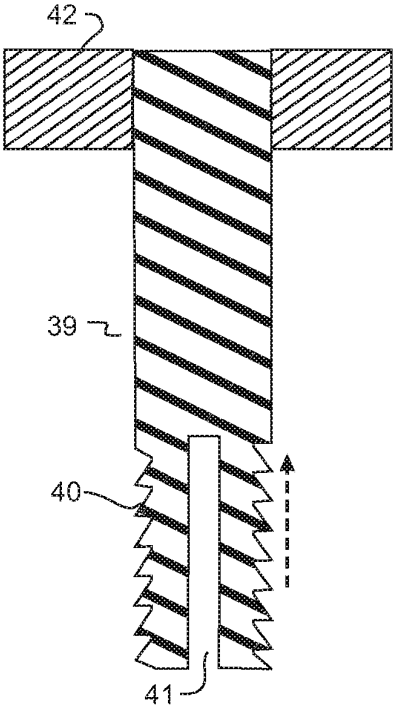


FIG. 43

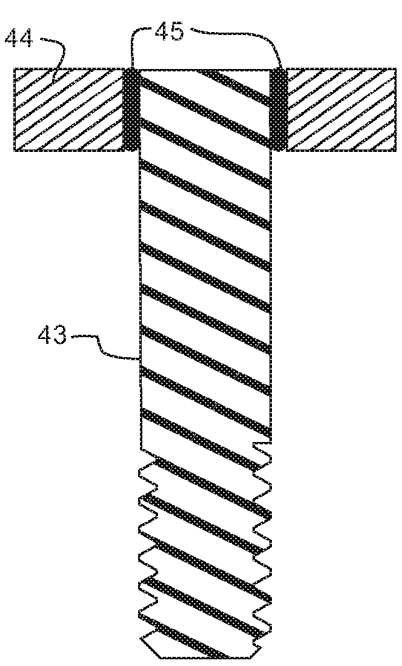


FIG. 44

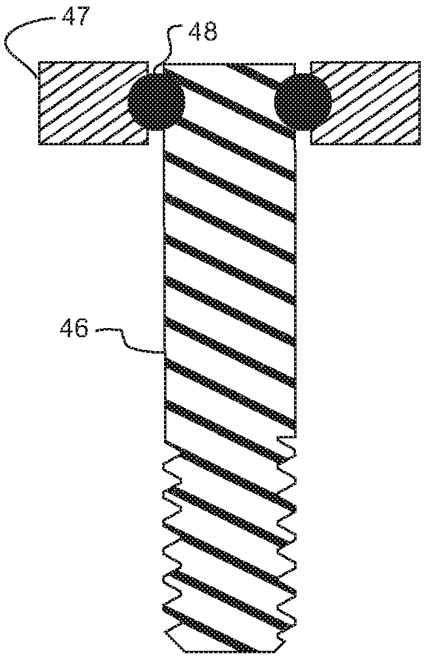


FIG. 45

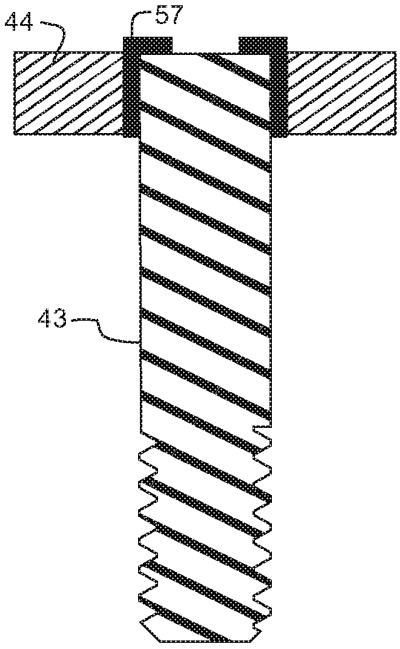


FIG. 46

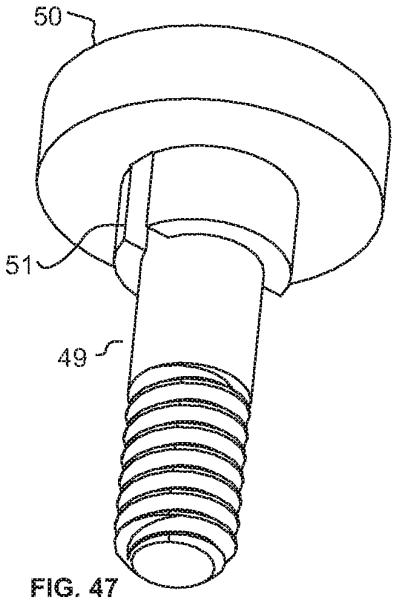


FIG. 47

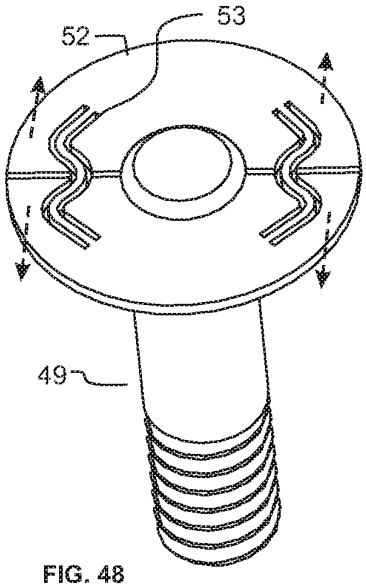


FIG. 48

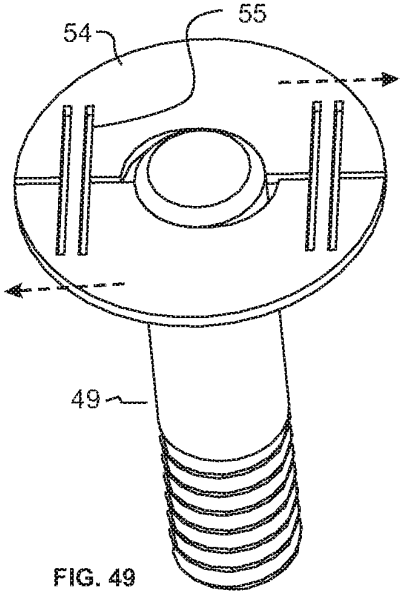


FIG. 49

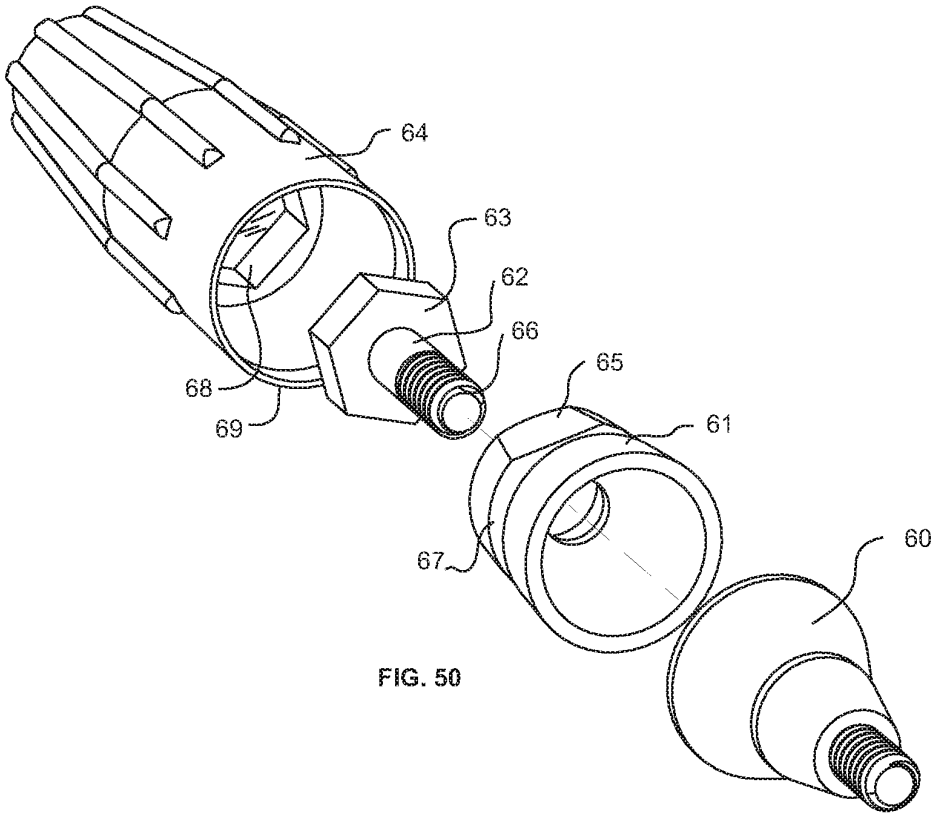


FIG. 50

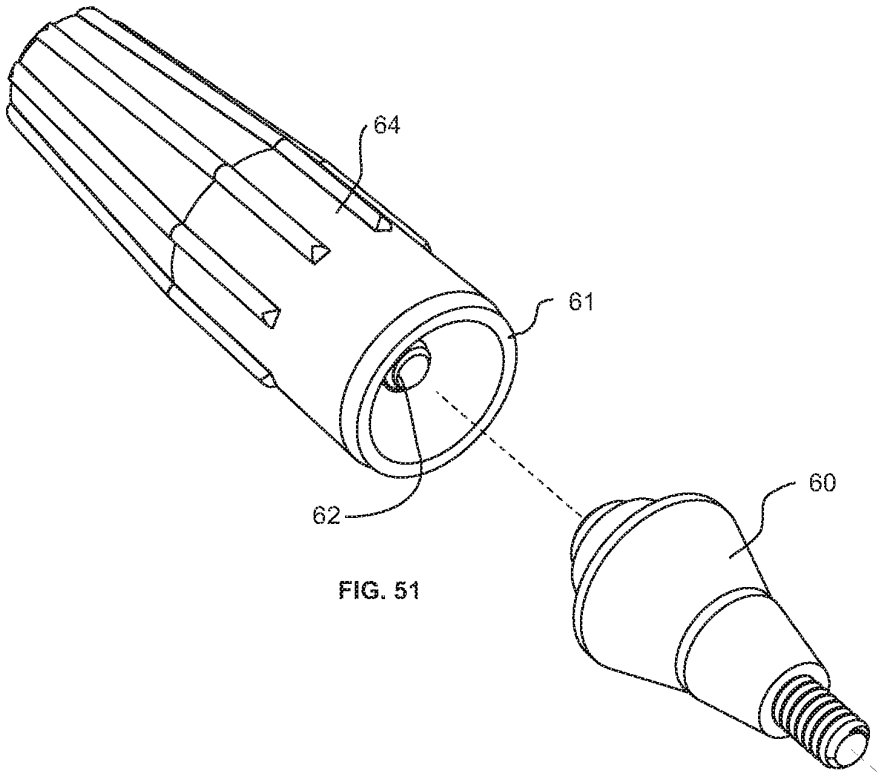


FIG. 51

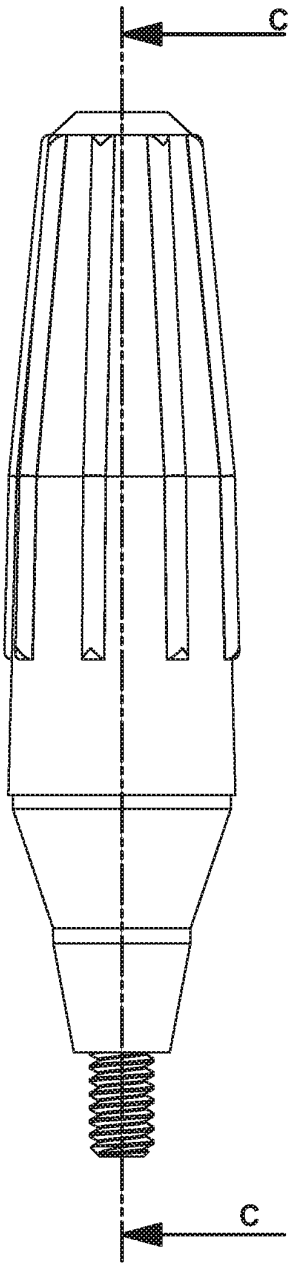


FIG. 52

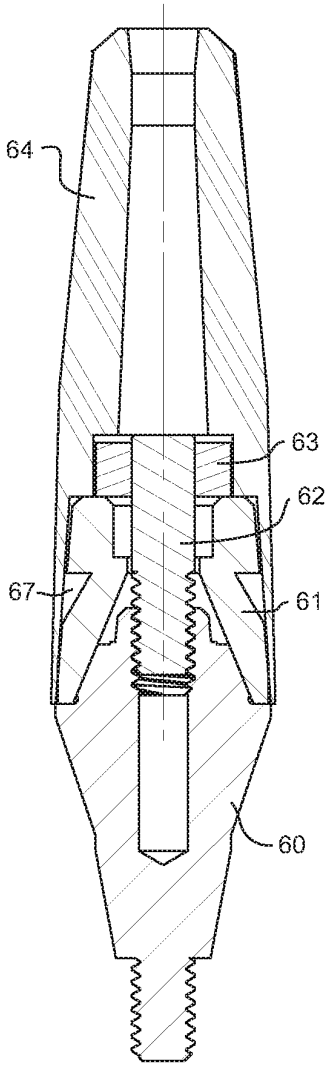


FIG. 53
(SECTION CC
OF FIG. 52)

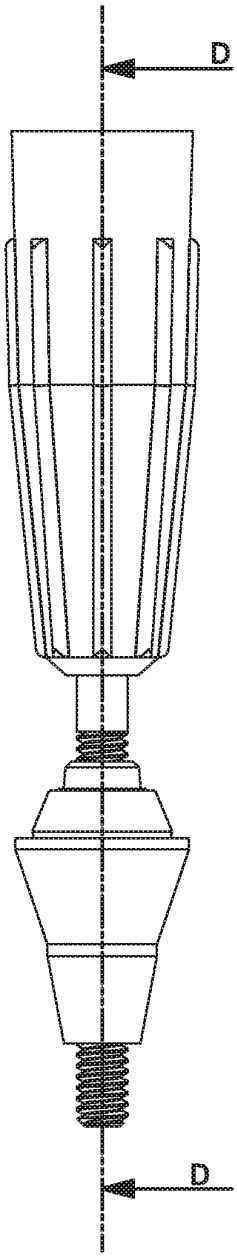


FIG. 54

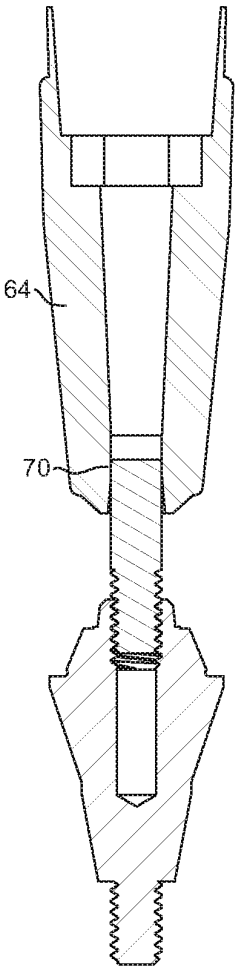


FIG. 55
(SECTION D-D
OF FIG. 54)

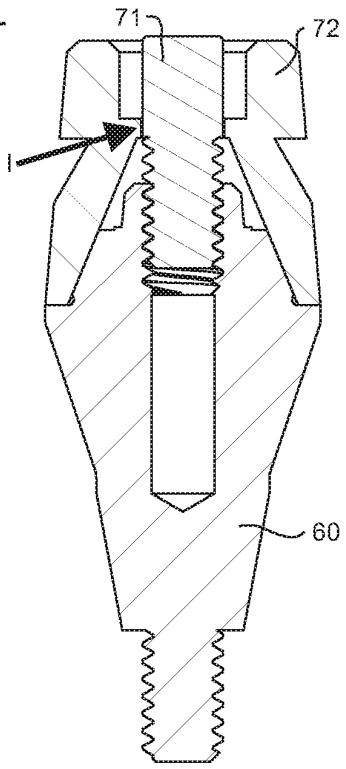


FIG. 56

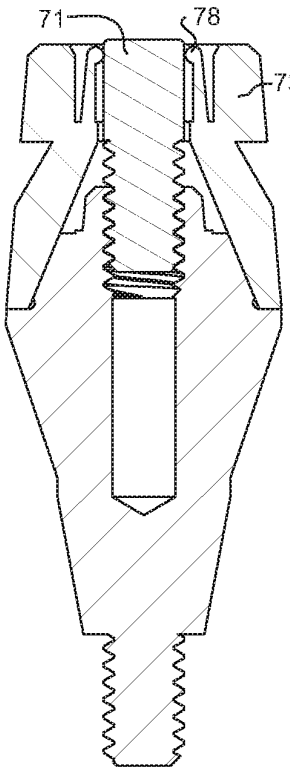


FIG. 57

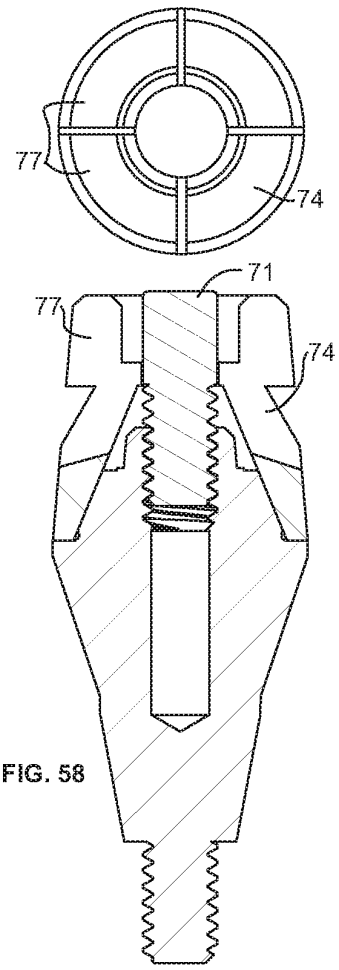


FIG. 58

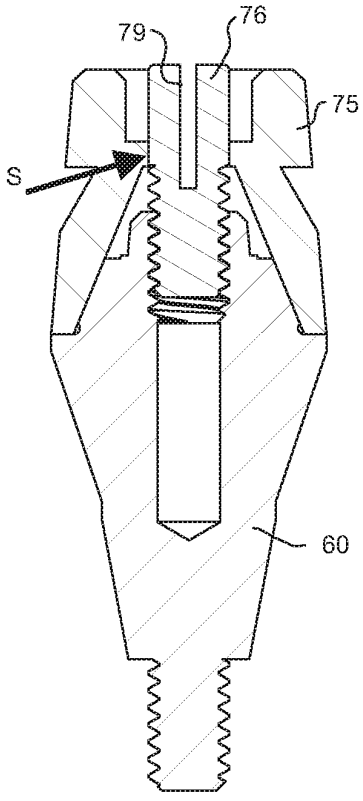


FIG. 59

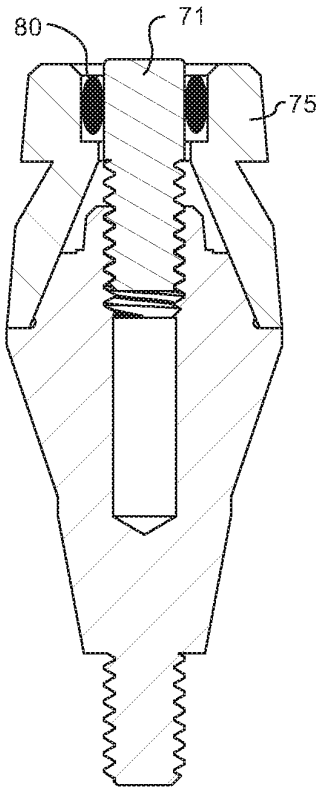


FIG. 60

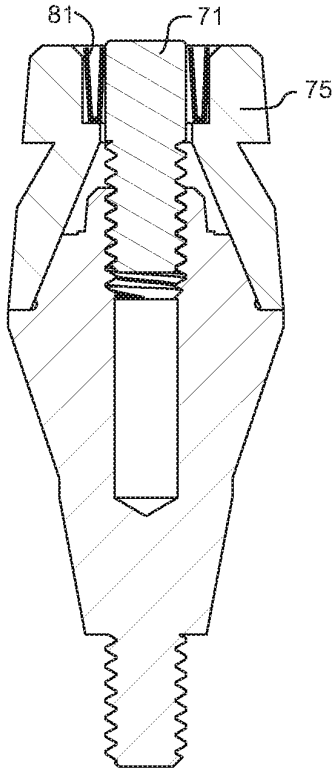


FIG. 61

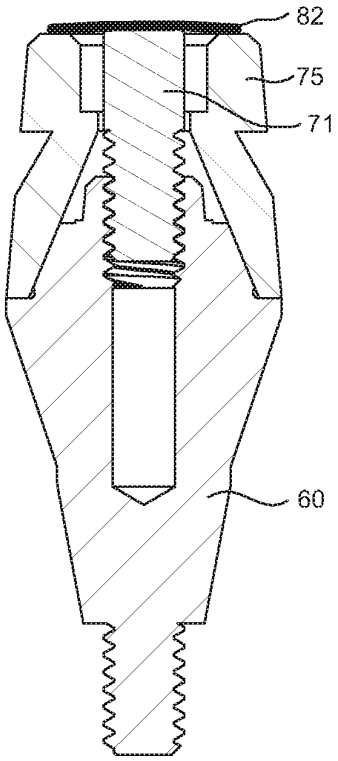


FIG. 62

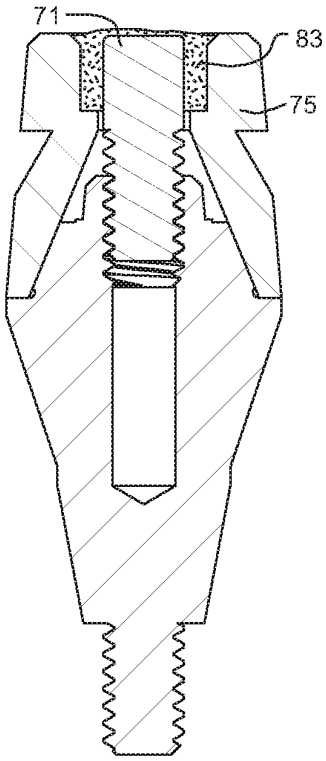


FIG. 62

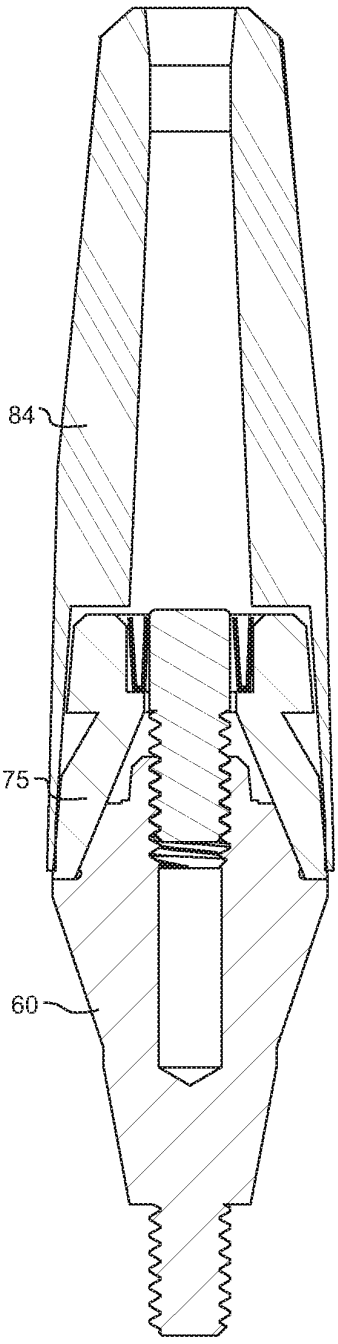


FIG. 63

| Electronic Acknowledgement Receipt | |
|---|---|
| **EFS ID:** | 34462299 |
| **Application Number:** | 62774402 |
| **International Application Number:** | |
| **Confirmation Number:** | 4612 |
| **Title of Invention:** | Direct pick-up coping system and method for screw attachment of dental prostheses to implants |
| **First Named Inventor/Applicant Name:** | Charles Albert Rudisill |
| **Correspondence Address:** | Charles Rudisill<br>-<br>3908 Bamburgh Lane<br>-<br>Apex NC 27539<br>US 9196561693<br>xxcar2@hotmail.com |
| **Filer:** | Charles Rudisill |
| **Filer Authorized By:** | |
| **Attorney Docket Number:** | |
| **Receipt Date:** | 03-DEC-2018 |
| **Filing Date:** | |
| **Time Stamp:** | 11:49:28 |
| **Application Type:** | Provisional |

## Payment information:

| | |
|---|---|
| Submitted with Payment | yes |
| Payment Type | CARD |
| Payment was successfully received in RAM | $140 |

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| RAM confirmation Number | 120318INTEFSW11524000 |
| Deposit Account | |
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## File Listing:

| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|---|---|---|---|---|---|
| 1 | Provisional Cover Sheet (SB16) | PP2-coping-system-and-method-ProvisionalSBcover-03dec2018.pdf | 177967<br>b5ab722482ea3391ea816a39e6582fbf8abd5b57 | no | 4 |
| **Warnings:** | | | | | |
| This is not a USPTO supplied Provisional Cover Sheet SB16 form. | | | | | |
| **Information:** | | | | | |
| 2 | Specification | PP2-coping-system-and-method-TEXT-FINAL-02dec2018.pdf | 108600<br>c8de3698596ae7308aa18c3ca9a1ecd5e603aba8 | no | 16 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 3 | Drawings-only black and white line drawings | PP2-coping-system-and-methods-FINAL-FIGS-02dec2018.pdf | 601936<br>e8dc6c06ef9f59d673614d111eb14467a1750236 | no | 15 |
| **Warnings:** | | | | | |
| **Information:** | | | | | |
| 4 | Fee Worksheet (SB06) | fee-info.pdf | 29509<br>d0f108018f3c7c4a943384a92896dc0fdbb1ed72 | no | 2 |
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**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

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

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

**New International Application Filed with the USPTO as a Receiving Office**

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