



- (51) International Patent Classification:
A61C 11/02 (2006.01)
- (21) International Application Number:
PCT/IB2013/051304
- (22) International Filing Date:
18 February 2013 (18.02.2013)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
2012/01203 17 February 2012 (17.02.2012) ZA
- (71) Applicant: **HALOCLOX (PROPRIETARY) LIMITED**
[ZA/ZA]; 17 Boca Walk, Centurion Golf Estate, Centurion, 0156 Pretoria, South Africa (ZA).
- (72) Inventor: **WESTDYK, Alan Michael**; 20 Welgelegen, Glenwood Road, Faerie Glen, 0043 Gauteng, South Africa (ZA).
- (74) Agents: **FIANDEIRO, João, Achada** et al.; Adams & Adams, PO Box 1014, 0001 Pretoria (ZA).
- (81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,

[Continued on next page]

(54) Title: VERTICALLY ADJUSTABLE ROTATIONAL STABILIZER FOR A DISPOSABLE ARTICULATOR

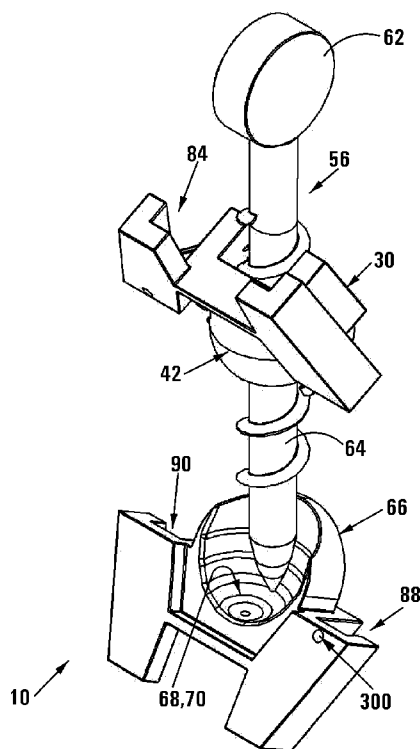


FIG 1

(57) Abstract: A vertically adjustable rotational stabilizer (10) for a disposable articulator is provided. The articulator comprises a hinged pair of support arms, each support arm having a proximal end and a distal end, with the proximal ends of the support arms being hinged together. Each arm defines an opening or cavity between its distal and proximal ends. The vertically adjustable rotational stabilizer (10), in broad terms, comprises at least one body (30, 66) secured or securable to the support arms (14, 16) and positioned substantially within the opening defined by the support arm, and an elongate member (56) being adjustable relative to the at least one body so as to adjust and fix the distance between the distal ends of the support arms (14, 16).



TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). **Published:**

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *of inventorship (Rule 4.17(iv))*

- *with international search report (Art. 21(3))*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

5

10

**VERTICALLY ADJUSTABLE ROTATIONAL STABILIZER FOR A DISPOSABLE
ARTICULATOR**

15

FIELD OF THE INVENTION

This invention relates to a vertically adjustable rotational stabilizer for a disposable articulator.

25

BACKGROUND TO THE INVENTION

30

A disposable articulator is a mechanical device used in dentistry to which casts of the maxillary (upper) and mandibular (lower) teeth are fixed, reproducing recorded positions of the mandible in relation to the maxilla. A disposable articulator assists in the fabrication of removable prosthodontic appliances (dentures), fixed prosthodontic restorations (crowns, bridges, inlays and onlays) and orthodontic appliances.

35

In one version of the disposable articulator, after an impression has been poured up, it is directly mounted on a plastic base or tray that already has a built-in condyle to form a complete articulator when the two halves are joined. However, at present, this type of articulator does not have a vertical rotational adjustment arrangement to adjust the separation of the two halves of the articulator. The present invention aims to address this shortcoming.

5

SUMMARY OF THE INVENTION

According to the invention there is provided a vertically adjustable rotational stabilizer for a disposable articulator, the articulator comprising a hinged pair of support arms, each support arm having a proximal end and a distal end, with the proximal ends of the support arms being hinged together, each arm defining an opening or cavity between its distal and proximal ends, the vertically adjustable rotational stabilizer, in broad terms, comprising at least one body secured or securable to the support arms and positioned substantially within the opening defined by the support arm, and an elongate rotational member being adjustable relative to the at least one body so as to adjust and fix the distance between the distal ends of the support arms.

In an embodiment, the stabilizer comprises:

a first body secured or securable to one of the support arms and positioned substantially within the opening defined by the support arm, the first body defining a seat with an aperture therein;

a first swivel body that can swivel within the seat of the first body, the first swivel body having a bore that can align with the aperture in the seat of the first body;

an elongate rotational adjusting member having a proximal end and a distal end and being arranged to snugly extend through, and be adjustable relative to, the bore of the first swivel body, the elongate rotational adjusting member also being arranged to extend through the aperture in the seat of the first body when the elongate rotational adjusting member and the first swivel body are seated within the seat of the first body; and

a second body secured or securable to the other support arm and positioned substantially within the opening defined by the support arm, the second body defining a receiving surface against which the distal end of the elongate rotational adjusting member can abut,

thereby allowing the relative distance between the distal ends of the support arms to be adjusted.

5 In an embodiment, the first swivel body is a truncated sphere that defines two substantially flat faces, with the bore extending through the flat faces of the first swivel body. The first swivel body further comprises a pair of lugs extending from opposite sides of the first swivel body.

10 In an embodiment, the seat of the first body includes a pair of curved side walls with an elongate groove therebetween so as to define the aperture, the curved side walls defining an aperture and/or a slot to receive the lugs of the first swivel body, the curved side walls thus accommodating the first swivel body to enable the first swivel body to swivel within the seat of the first body around an axis defined by the lugs.

15 In an embodiment, the first body includes a pawl proximate the aperture of the seat, and the first swivel body comprises a plurality of teeth on an exterior surface (approximately midway between the lugs and in line with the bore) so as to define a ratchet to facilitate the correct orientation of the first swivel body relative to the first body.

20 In an embodiment, the elongate rotational adjusting member comprises a handle portion proximal its proximal end and a threaded shank extending from the handle portion and terminating in its distal end, with the bore of the first swivel body being complementarily threaded with respect to the threaded shank, so that the adjusting member is adjustable
25 relative to the first swivel body.

In an embodiment, the second body comprises a socket having a curved receiving surface. In an embodiment, the curved receiving surface comprises ridges/slots against which the distal end of the elongate rotational adjusting member can rest/grip.

30 In an alternate embodiment, the second body defines a seat with an aperture therein, with a second swivel body being able to swivel within the seat of the second body, the second swivel body comprising a socket having a curved receiving surface against which the distal end of the elongate rotational adjusting member can rest/grip.

35 In one version, the first and second bodies take the form of clip bodies that can be secured or removably clipped onto (or rest on or be supported by or glued to) the support arms. In this version, the first and second bodies comprise clipping formations to enable them to be clipped onto the support arms. The clipping formations comprise deformable lugs on either
40 side of the bodies, which can be snap fitted into corresponding recesses defined in the support arms.

5

In an alternate version, the first and second bodies are integrally formed with the support arms.

10 **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be described, by way of example only, with reference to the accompanying drawings in which:

15 **Figure 1** shows a perspective view of a vertically adjustable rotational stabilizer for a disposable articulator, according to a first embodiment of the present invention;

20 **Figure 2** shows a perspective view of a first, upper body of the stabilizer shown in Figure 1;

Figure 3 shows a perspective view of a swivel body of the stabilizer shown in Figure 1;

25 **Figure 4** shows a perspective view of an rotational adjusting member of the stabilizer shown in Figure 1;

Figure 5 shows a perspective view of a second, lower body of the stabilizer shown in Figure 1;

30 **Figures 6 and 7** show perspective views of an alternative second, lower body that may be used with the stabilizer shown in Figure 1;

Figure 8 shows a perspective view of an example articulator to which the stabilizer shown in Figure 1 can be fitted;

35

Figure 9 shows a perspective view of a vertically adjustable rotational stabilizer for a disposable articulator, according to a second embodiment of the present invention;

40 **Figure 10** shows a perspective view of a first, upper body of the stabilizer shown in Figure 9;

5

Figure 11 shows a perspective view of a second, lower body of the stabilizer shown in Figure 9;

10

Figure 12 shows a perspective view of an example articulator to which the stabilizer shown in Figure 9 can be fitted;

Figure 13 shows a perspective view of an alternate first, upper body for use in the stabilizer shown in Figure 9;

15

Figure 14 shows a perspective view of an alternate second, lower body for use in the stabilizer shown in Figure 9;

20

Figure 15 shows a perspective view of a vertically adjustable rotational stabilizer for a disposable articulator, according to a third embodiment of the present invention;

Figure 16 shows a perspective view of a first, upper body of the stabilizer shown in Figure 13;

25

Figure 17 shows a perspective view of a second, lower body of the stabilizer shown in Figure 13; and

30

Figures 18 to 20 show various views of a vertically adjustable rotational stabilizer for a disposable articulator, according to yet a further embodiment of the present invention;

DETAILED DESCRIPTION OF THE DRAWINGS

35

Referring first to Figure 1 there is provided a vertically adjustable rotational stabilizer 10 for a disposable articulator, according to a first embodiment of the present invention. An example articulator 12 to which the stabilizer 10 shown in Figure 1 can be fitted will now be described with reference to Figure 8. The articulator 12 comprises a hinged pair of support arms 14, 16, each support arm 14, 16 having a proximal end 18 and a distal end 20, with the proximal ends 18 of the support arms 14, 16 being hingedly fitted together with a thin walled hinge 22.

40

5 Each arm 14, 16 defines an opening or cavity 24, 26 between its proximal and distal ends 18, 20.

Referring back to Figure 1 and also to Figure 2, the vertically adjustable rotational stabilizer 10 comprises a first, upper body 30 secured or securable to one of the support arms 14 of
10 the articulator 12 in Figure 8. The first body 30 is arranged to be positioned substantially within the opening 24 defined by the support arm 14, the first body 30 defining a seat 32 with an elongate, rectangular aperture 34.

In an embodiment, the seat 32 of the first body 30 includes a pair of curved side walls 35, 36
15 with an elongate groove 38 therebetween so as to define the aperture 34. With reference now also to Figure 3, the curved side walls 35, 36 define an aperture 39 and a slot 40 to receive the lugs 40, 41 of a first swivel body 42, which shall be described in more detail further below. In an alternative embodiment, the curved side walls 35, 36 may define a pair
20 of slots (similar to slot 40) to receive the lugs 40, 41 of a first swivel body 42.

The curved side walls 35, 36 thus accommodate the first swivel body 42 to enable the first
swivel body 42 to swivel within the seat 32 of the first body 30 around an axis defined by the lugs 40, 41. The first swivel body 42 has a bore 44 that can align with the aperture 34 in the seat 32 of the first body 30.
25

In an embodiment, the first swivel body 42 is a truncated sphere 46 that defines two
substantially flat faces 48, 50, with the bore 44 extending through the flat faces 48, 50 of the first swivel body 42. The lugs 38, 40 extend from opposite sides of the first swivel body 42.

30 In an embodiment, the first body 30 includes a pawl 52 proximate the aperture 34 of the seat 32. The first swivel body 42 comprises a plurality of teeth 54 on an exterior surface (approximately midway between the lugs 40, 41 and in line with the bore 44) so as to define a ratchet to facilitate the correct orientation of the first swivel body 42 relative to the first body 30. This ratchet arrangement allows the first upper body 30 to determine the resting position
35 of the stabilizer 10.

In particular, the elongate aperture 34 guides the stabilizer 10 along a defined path to stabilize the distance between two points in a given direction of motion. This elongate aperture 34 also predetermines the vertical adjustment of the distal ends 20 of the support
40 arms 14, 16 of the articulator 12 from a minimum to a maximum elevation. Clearly, the greater the angle between the support arms 14, 16, the greater the rotational arc of the

5 guiding aperture 34, and *vice versa*. In particular, the smaller the angle between the support arms 14, 16, the smaller the rotational arc to a minimum vertical position. The rectangular aperture 34 thus allows the stabilizer 10 the freedom to rotate to achieve a maximum and a minimum position. The vertical adjustable rotational vertical stabilizer 10 thus allows lateral, protrusive and orbital movement.

10

Referring now also to Figure 4, the stabilizer 10 further comprises an elongate rotational adjusting member 56 having a proximal end 58 and a distal end 60. The member 56 is arranged to snugly extend through, and be adjustable relative to, the bore 44 of the first swivel body 42. The elongate rotational adjusting member 56 is also arranged to extend
15 through the elongate, rectangular aperture 34 in the seat 32 of the first body 30 when the elongate rotational adjusting member 56 and the first swivel body 42 are seated within the seat 32 of the first body 30, as shown in Figure 1.

In an embodiment, the elongate rotational adjusting member 56 comprises a handle portion
20 62 proximal its proximal end 58 and a threaded shank 64 extending from the handle portion 62 and terminating at its distal end 60. The bore 44 of the first swivel body 42 is complementarily threaded with respect to the threaded shank 64, so that the rotational adjusting member 56 is adjustable (and fixable) relative to the first swivel body 42.

25 Referring now also to Figure 5, the stabilizer 10 further comprises a second, lower body 66 secured or securable to the other support arm 16 of the articulator 12 and positioned substantially within the opening 26 defined by the support arm 16. The second body 66 defines a receiving surface 68 against which the distal end 60 of the elongate rotational adjusting member 56 can abut, as shown in Figure 1. The entire stabilizer 10 thus allows
30 the relative distance between the distal ends 20 of the support arms 14, 16 of the articulator 12 to be adjusted (and fixed), as described above.

In an embodiment, the second body 66 comprises a socket 70 having a curved receiving surface 68. In an embodiment, the curved receiving surface 68 comprises formations 72
35 (typically, ridges and/or slots) against which the distal end 60 of the elongate rotational adjusting member 56 can rest/grip.

In an alternate embodiment, with reference now to Figures 6 and 7, a modified second body 66A defines a seat 74 with a round aperture 76 therein. A second swivel body 78 is thus
40 able to swivel within the seat 74 of the second body 66, the second swivel body 78 comprising a socket 80 having a curved receiving surface 82 against which the distal end 60

5 of the elongate rotational adjusting member 56 can rest/grip. The seat 74 of the modified second body 66A includes a pair of curved side walls 83A, 83B, the curved side walls 83A, 83B defining an aperture 83C and a slot 83D to receive the lugs 83E, 83F of the second swivel body 78. Alternatively, the pair of curved side walls 83A, 83B may define a pair of slots, similar to slot 83D, to receive the lugs 83E, 83F of the second swivel body 78.

10 The curved side walls 83A, 83B thus accommodate the second swivel body 78 to enable the second swivel body 78 to swivel within the seat 74 of the second body 66A around an axis defined by the lugs 83E, 83F. This alternate embodiment is particularly useful for patients with extreme dental conditions.

15 In one version, the first and second bodies 30, 66, 66A take the form of clip bodies that can be secured to or removably clipped onto the support arms 14, 16 of the articulator 12. In this version, the first and second bodies 30, 66 comprise clipping formations 84 and 86, 88 and 90, and 92 and 94, respectively, to enable them to be clipped onto the support arms 14, 16. The clipping formations may comprise deformable lugs on either side of the bodies 30, 66, which can be fitted into corresponding recesses defined in the support arms 14, 16.

Alternatively, it is envisaged that the clip bodies can simply rest on or be supported by or be glued to the support arms 14, 16.

25 Although not shown, in an alternate version, the first and second bodies 30, 66 may be integrally formed with the support arms 14, 16 of the articulator 12.

Referring now to Figure 9 there is provided a vertically adjustable rotational stabilizer 110 for a disposable articulator, according to a second embodiment of the present invention. An example articulator 112 to which the stabilizer 110 shown in Figure 9 can be fitted will now be described with reference to Figure 12. The articulator 112 comprises a hinged pivotal pair of support arms 114, 116, each support arm 114, 116 having a proximal end 118 and a distal end 120, with the proximal ends 118 of the support arms 114, 116 being pivotally fitted together with pivot pins 122. Each arm 114, 116 defines an opening or cavity 124, 126 between its proximal and distal ends 118, 120.

Referring back to Figure 9 and also to Figure 10, the vertically adjustable rotational stabilizer 110 comprises a first, upper body 130 secured or securable to one of the support arms 114 of the articulator in Figure 12. The first body 130 is arranged to be positioned substantially within the opening 124 defined by the support arm 114, the first body 130 defining a seat

5 132 with an elongate, rectangular aperture 134. The structure of the seat 132 of the first body 130 is substantially similar to the seat 32 described above with reference to the first body 30, and thus similar components are numbered similarly save for the numerical prefix "1". In particular, the seat 132 accommodates a first swivel body, of the type already described above, which can swivel within the seat 132 of the first body 130. In addition, the
10 stabilizer 110 also makes use of an elongate rotational adjusting member, which has already been described above and will thus not be repeated.

Turning now to Figure 11, the stabilizer 110 further comprises a second, lower body 166 secured or securable to the other support arm 116 and positioned substantially within the
15 opening 126 defined by the support arm 116. Again, the second body 166 defines a receiving surface 168 against which the distal end 160 of the elongate rotational adjusting member 156 can abut. The entire stabilizer 110 thus allows the relative distance between the distal ends 120 of the support arms 114, 116 to be adjusted (and fixed), as described above.

20 In one version, the first and second bodies 130, 166 take the form of clip bodies that can be secured to or removably clipped onto the support arms 114, 116 of the articulator 112. In this version, the first and second bodies 130, 166 comprise clipping formations 184 and 186, and 188 and 190, respectively, on wing elements 192, 194 extending from the bodies 130,
25 166 to enable them to be clipped onto complementary clipping formations 196, 198 on the support arms 114, 116 in a substantially friction fit manner.

As described above, it is envisaged that the clip bodies can simply rest on or be supported by or be glued or cemented to the support arms 114, 116.

30 Although not shown, in an alternate version, the first and second bodies 130, 166 may be integrally formed with the support arms 114, 116 of the articulator 112.

In yet a further alternate version, as shown in Figures 13 and 14, the first, upper and second,
35 lower bodies 200, 201 only have one wing 202, 203, respectively. In addition, these bodies 200, 201 have guiding pins 204, 205, respectively, to facilitate the positioning of these bodies on the articulator 112. Finally, each body 200, 201 includes a double-stepped recessed arrangement 207, 208, to enable these bodies to be secured to the arms 114, 116 of the articulator 112.

5 Referring now to Figures 15 to 17 there is provided a vertically adjustable rotational stabilizer 210 for the disposable articulator 112 shown in Figure 12, according to a third embodiment of the present invention. The vertically adjustable rotational stabilizer 210 comprises a first, upper body 230 (which is shown in more detail in Figure 16) and a second, lower body 266 (which is shown in more detail in Figure 17), secured or securable to the support arms 114,
10 116 of the articulator in Figure 12. The first and second bodies 230, 266 are substantially the same as the first and second bodies 130, 166 described above, save for the omission of the wing elements 184, 186 extending from the bodies 130, 166. The first and second bodies 230, 266 thus simply clip onto the articulator 112 using clipping formations 290, 292 formed on the back of the first and second bodies 230, 266. The first and second bodies
15 230, 266 can also be secured by a bonding agent or cement. For the rest, the stabilizer 210 operates as described above, which shall not be repeated, except to mention that similar components are numbered similarly save for the numerical prefix "2". Although not shown, in an alternate version, the first and second bodies 230, 266 may be integrally formed with the support arms 114, 116 of the articulator 112.

20 The stabilizers 10, 110, 210 may carry markings 300 to enable the visually impaired to work with the stabilizers of the present invention.

Although the invention has been described and illustrated with reference to only two
25 currently available articulators 12, 112, the components of the invention, and in particular the bodies 30 and 66, 130 and 166, and 230 and 266, have been designed to be usable on a wide variety of currently available disposable articulators.

A further embodiment of a vertically adjustable rotational stabilizer 310 will now be described
30 with reference to Figures 18 to 20. The vertically adjustable rotational stabilizer 310 comprises a first, upper body 312 secured or securable to a support arm of an articulator. The first body 312 defines a seat 314 with an elongate, rectangular aperture 316.

In an embodiment, the seat 314 of the first body 312 includes a pair of curved side walls
35 318, 320 that define the aperture 316. The curved side walls 318, 320 define a pair of slots 322, 324 to receive the lugs 326, 328 of a first swivel body 330. The first swivel body 330 is substantially as described above with reference to Figure 3, and will thus not be described in more detail.

40 The curved side walls 318, 320 thus accommodate the first swivel body 330 to enable the first swivel body 330 to swivel within the seat 314 of the first body 312 around an axis

5 defined by the lugs 326, 328. The first swivel body 330 has a bore 332 that can align with the aperture 316 in the seat 314 of the first body 312.

Although not marked, the first body 312 includes a pawl proximate the aperture 316 of the seat 314. The first swivel body 330 comprises a plurality of teeth 334 on an exterior surface
10 so as to define a ratchet to facilitate the correct orientation of the first swivel body 330 relative to the first body 312.

The stabilizer 310 further comprises an elongate rotational adjusting member 336 having a proximal end 338 and a distal end 340. The member 336 is arranged to snugly extend
15 through, and be adjustable relative to, the bore 332 of the first swivel body 330. The elongate rotational adjusting member 336 is also arranged to extend through the elongate, rectangular aperture 316 in the seat 314 of the first body 312 when the elongate rotational adjusting member 336 and the first swivel body 330 are seated within the seat 314 of the first body 312, as shown in Figures 18 and 19. The remaining components of the elongate
20 rotational adjusting member 336 are as described above.

The stabilizer 310 further comprises a second, lower body 342 secured or securable to the other support arm of an articulator 12. The second body 342 defines a receiving surface 344 against which the distal end 340 of the elongate rotational adjusting member 336 can abut,
25 as shown in Figure 19 and as described above.

The first and second bodies 312, 342 include curved formations 350, 352, respectively, to accommodate complementally shaped arms of the articulator to which the stabilizer 310 may be fitted. In addition, these bodies 312, 342 include elongate wings 354, 356 to further
30 facilitate the fitment of the bodies 312, 342 to the articulator, although in a further embodiment, these wings 354, 356 may be omitted.

The present invention thus provides a versatile and economical vertically adjustable rotational stabilizer for a disposable articulator. In terms of its versatility, the stabilizers of
35 the present invention can perform the following dental work:

1. Prosthetics/ Acrylic Dentures (edentulous dentures/no teeth, full upper denture, full lower denture, partial dentures (no posterior teeth, 2 anterior teeth, or 4 to 8 teeth missing in mouth));

40

2. Chrome Cobalt/Metal Dentures, or with free end saddles, (edentulous dentures/no

- 5 teeth, full upper denture, full lower denture, partial dentures (no posterior teeth, 2 anterior teeth, or 4 to 8 teeth missing in mouth));
3. Crown and Bridge/Porcelain Crowns (1 to 3 anterior porcelain crowns with posterior present, 4 to 6 posterior porcelain crowns (upper and lower jaws), posterior cantilever
- 10 bridges (no posterior teeth support), posterior free end bridges (no posterior teeth support, upper and lower jaws)); and
4. Orthodontics/Teeth correcting Procedures (bite plates and gum guards)

5 **CLAIMS**

1. A vertically adjustable rotational stabilizer for a disposable articulator, the articulator comprising a hinged pair of support arms, each support arm having a proximal end and a distal end, with the proximal ends of the support arms being hingedly fitted together, each
10 arm defining an opening or cavity between its distal and proximal ends, the vertically adjustable rotational stabilizer comprising at least one body secured or securable to the support arms and positioned substantially within the opening defined by the support arm, and an elongate member being adjustable relative to the at least one body so as to adjust and fix the distance between the distal ends of the support arms.

15 2. The vertically adjustable rotational stabilizer of claim 1, wherein the stabilizer comprises:

a first body secured or securable to one of the support arms and positioned substantially within the opening defined by the support arm, the first body
20 defining a seat with an aperture therein;

a first swivel body that can swivel within the seat of the first body, the first swivel body having a bore that can align with the aperture in the seat of the first body;

25 an elongate adjusting member having a proximal end and a distal end and being arranged to snugly extend through, and be adjustable relative to, the bore of the first swivel body, the elongate adjusting member also being arranged to extend through the aperture in the seat of the first body when the
30 elongate adjusting member and the first swivel body are seated within the seat of the first body; and

a second body secured or securable to the other support arm and positioned substantially within the opening defined by the support arm, the second body
35 defining a receiving surface against which the distal end of the elongate adjusting member can abut,

thereby allowing the relative distance between the distal ends of the support arms to be adjusted.

- 5 3. The vertically adjustable rotational stabilizer of claim 2, wherein the first swivel body is a truncated sphere that defines two substantially flat faces, with the bore extending through the flat faces of the first swivel body.
4. The vertically adjustable rotational stabilizer of claim 3, wherein the first swivel body
10 further comprises a pair of lugs extending from opposite sides of the first swivel body.
5. The vertically adjustable rotational stabilizer of claim 4, wherein the seat of the first body includes a pair of curved side walls with an elongate groove therebetween so as to define the aperture, the curved side walls defining an aperture and/or a slot to receive the lugs of
15 the first swivel body, the curved side walls thus accommodating the first swivel body to enable the first swivel body to swivel within the seat of the first body around an axis defined by the lugs.
6. The vertically adjustable rotational stabilizer of any one of claims 4 to 5, wherein the first
20 body includes a pawl proximate the aperture of the seat, and the first swivel body comprises a plurality of teeth on an exterior surface, approximately midway between the lugs and in line with the bore, so as to define a ratchet to facilitate the correct orientation of the first swivel body relative to the first body.
7. The vertically adjustable rotational stabilizer of any one of claims 2 to 6, wherein the
25 elongate adjusting member comprises a handle portion proximate its proximal end and a threaded shank extending from the handle portion and terminating in its distal end, with the bore of the first swivel body being complementarily threaded with respect to the threaded shank, so that the adjusting member is adjustable relative to the first swivel body.
30
8. The vertically adjustable rotational stabilizer of claim 7, wherein the second body comprises a socket having a curved receiving surface.
9. The vertically adjustable rotational stabilizer of claim 8, wherein the curved receiving
35 surface comprises ridges and/or slots against which the distal end of the elongate adjusting member can rest and/or grip.
10. The vertically adjustable rotational stabilizer of claim 7, wherein the second body defines a seat with an aperture therein, with a second swivel body being able to swivel within the
40 seat of the second body, the second swivel body comprising a socket having a curved

5 receiving surface against which the distal end of the elongate adjusting member can rest and/or grip.

11. The vertically adjustable rotational stabilizer of any one of the preceding claims, wherein the first and second bodies take the form of clip bodies that can be secured or removably
10 clipped onto the support arms.

12. The vertically adjustable rotational stabilizer of claim 11, wherein the first and second bodies comprise clipping formations to enable them to be clipped onto the support arms.

15 13. The vertically adjustable rotational stabilizer of claim 12, wherein the clipping formations comprise deformable lugs on either side of the bodies, which can be snap fitted into corresponding recesses defined in the support arms.

14. The vertically adjustable rotational stabilizer of claim 11, wherein the first and second
20 bodies are integrally formed with the support arms.

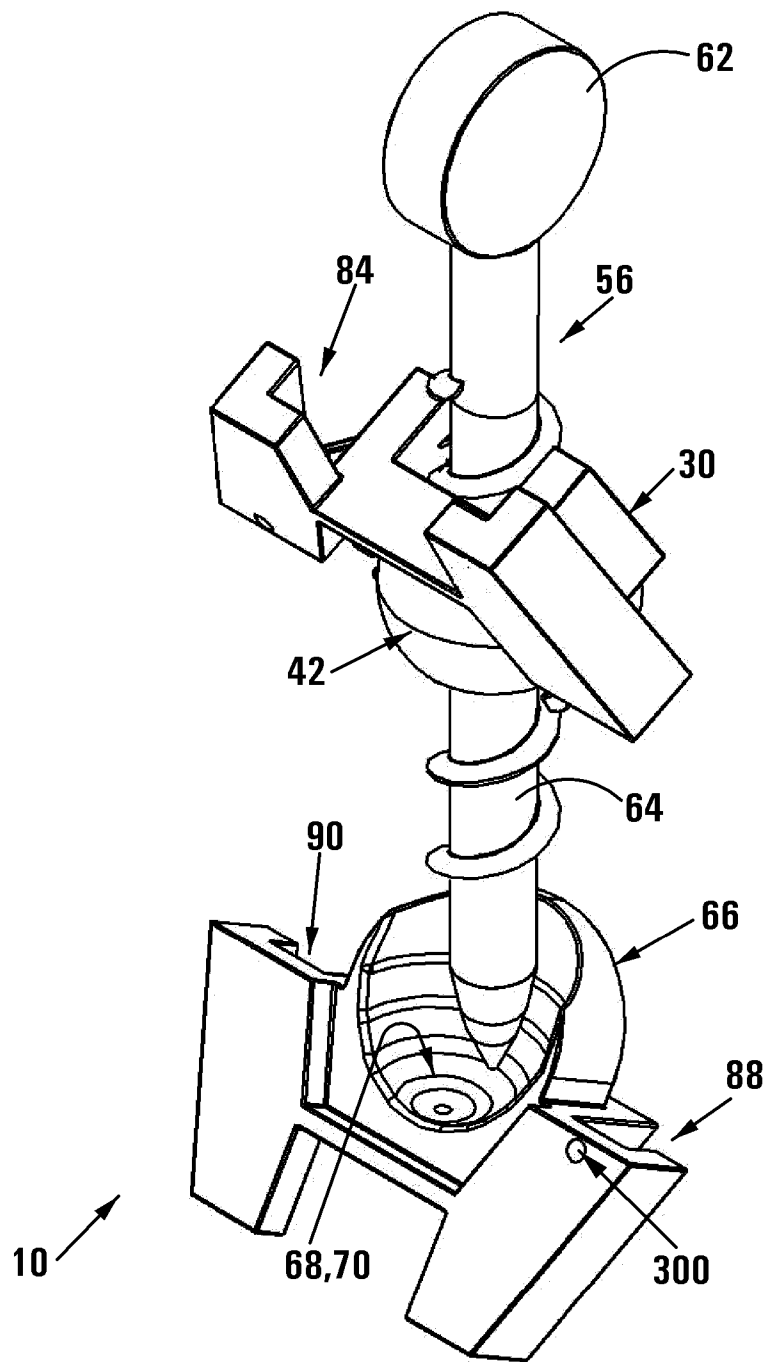


FIG 1

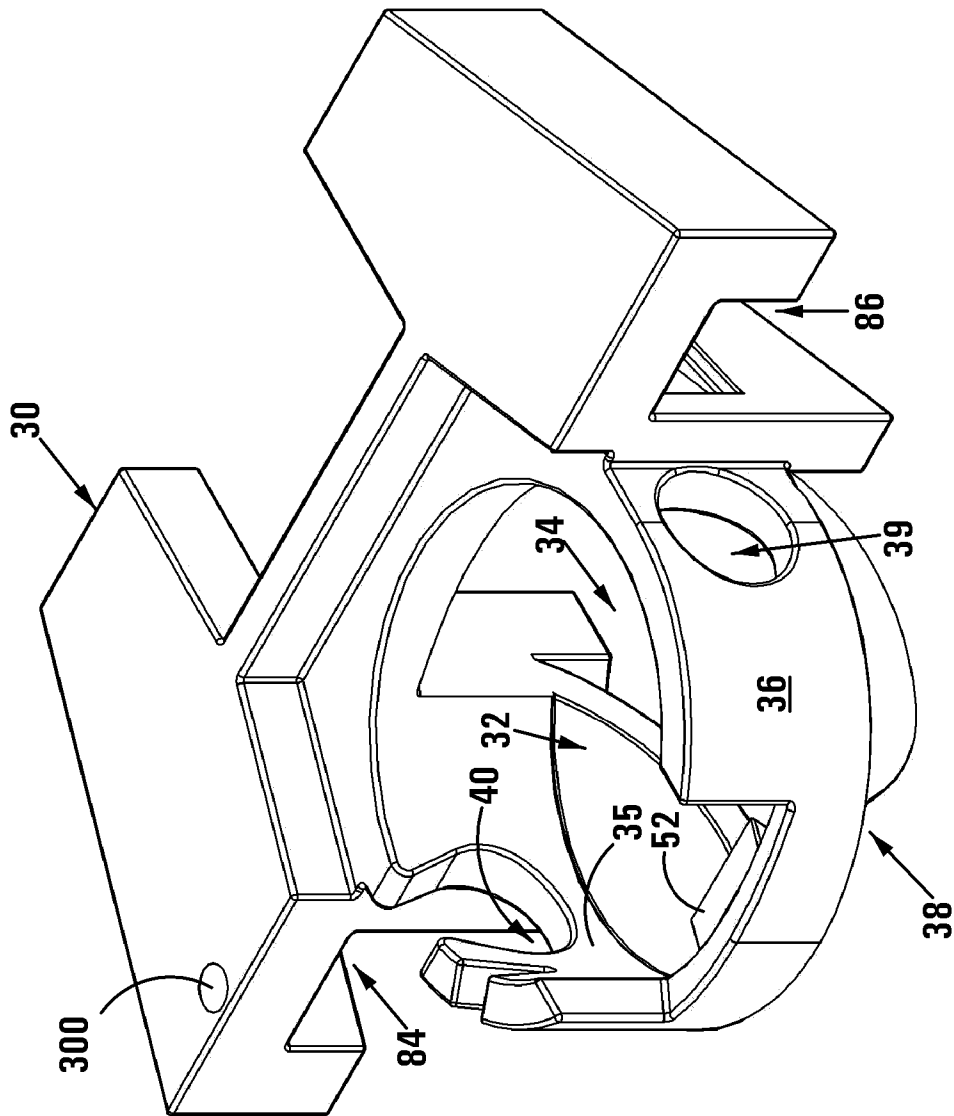


FIG 2

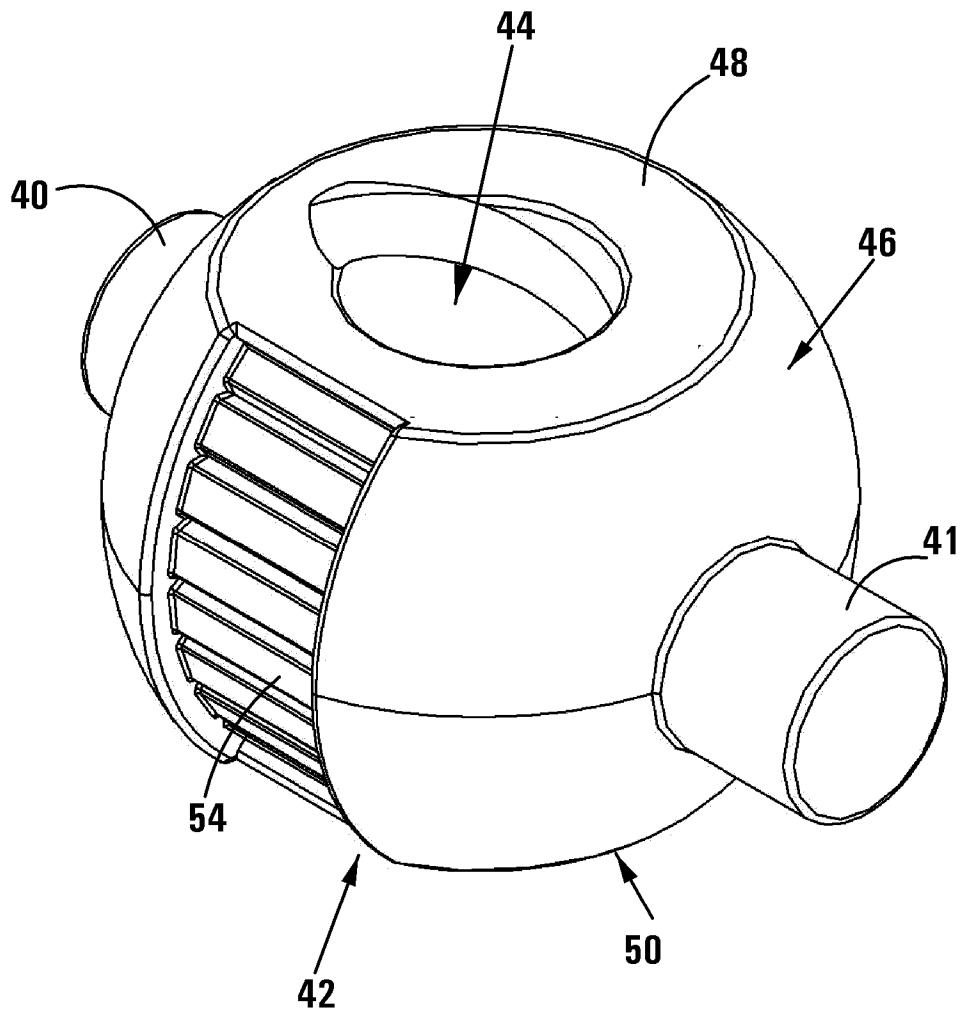
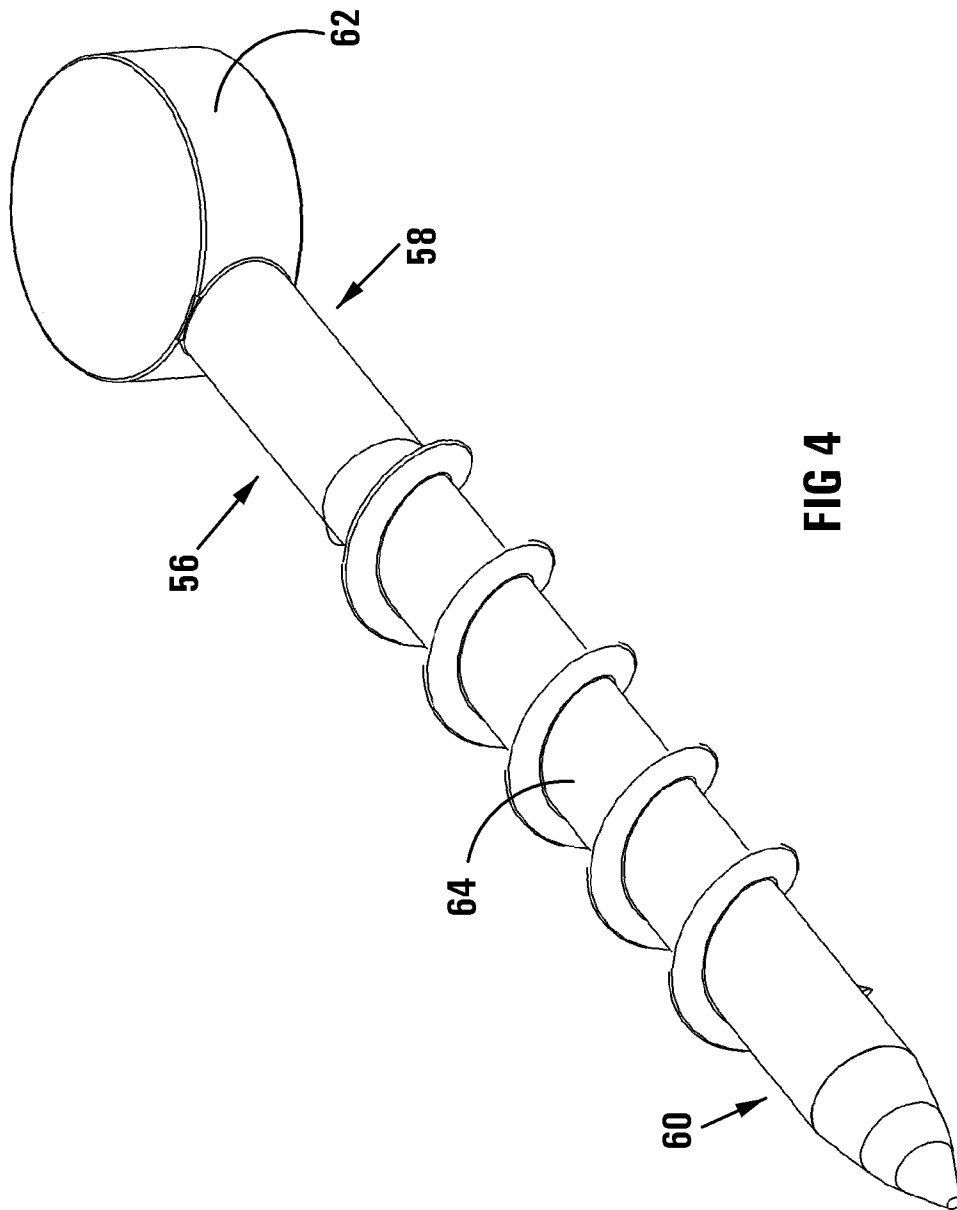
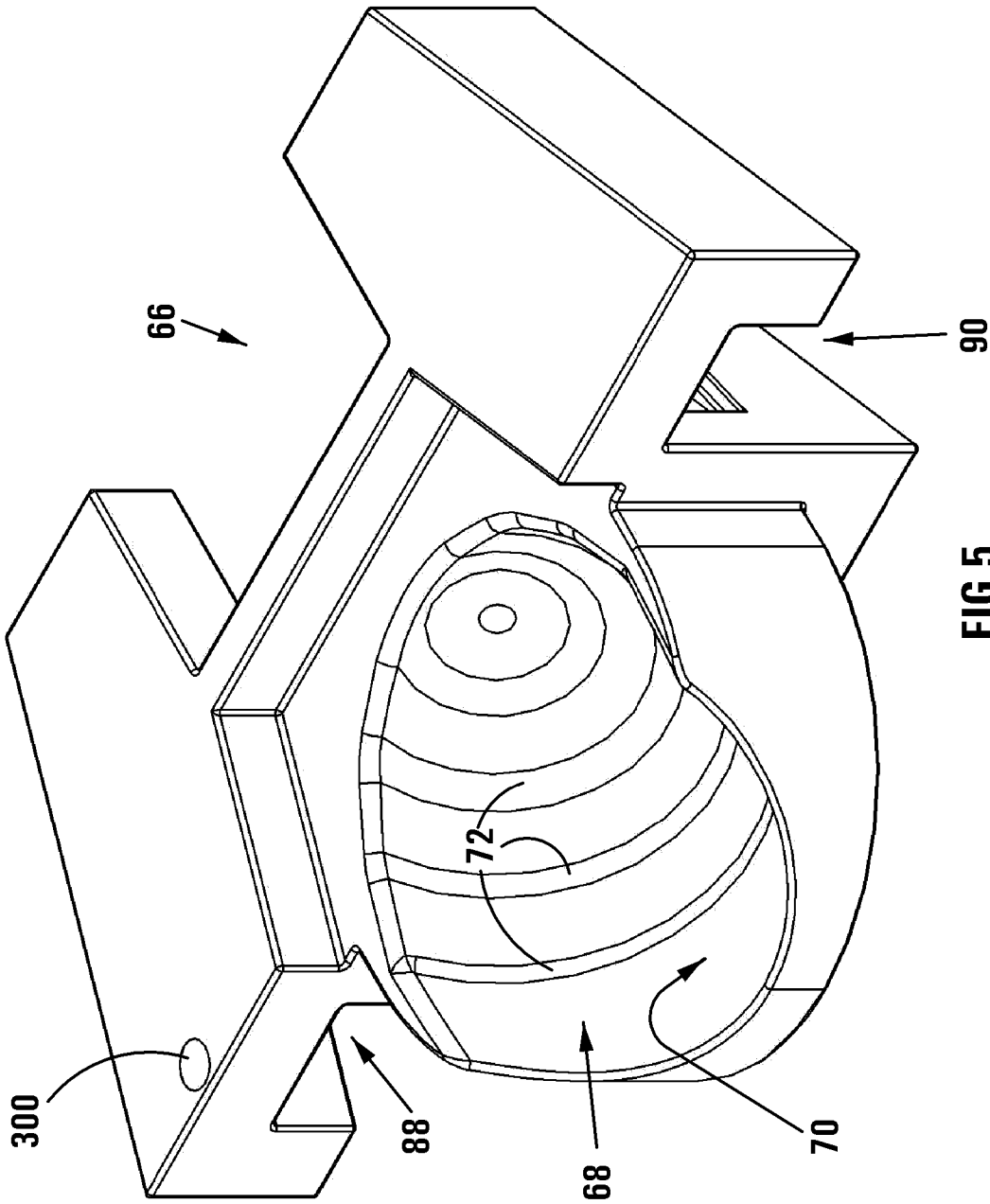


FIG 3





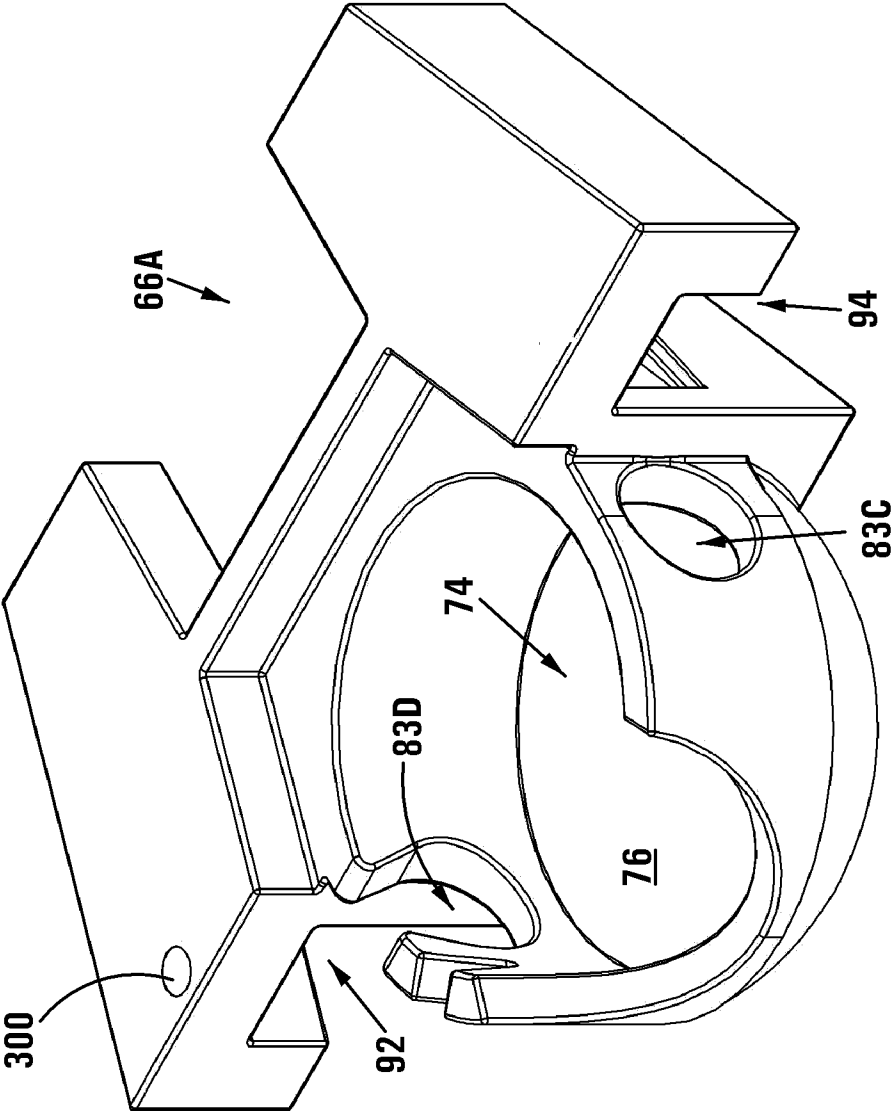


FIG 6

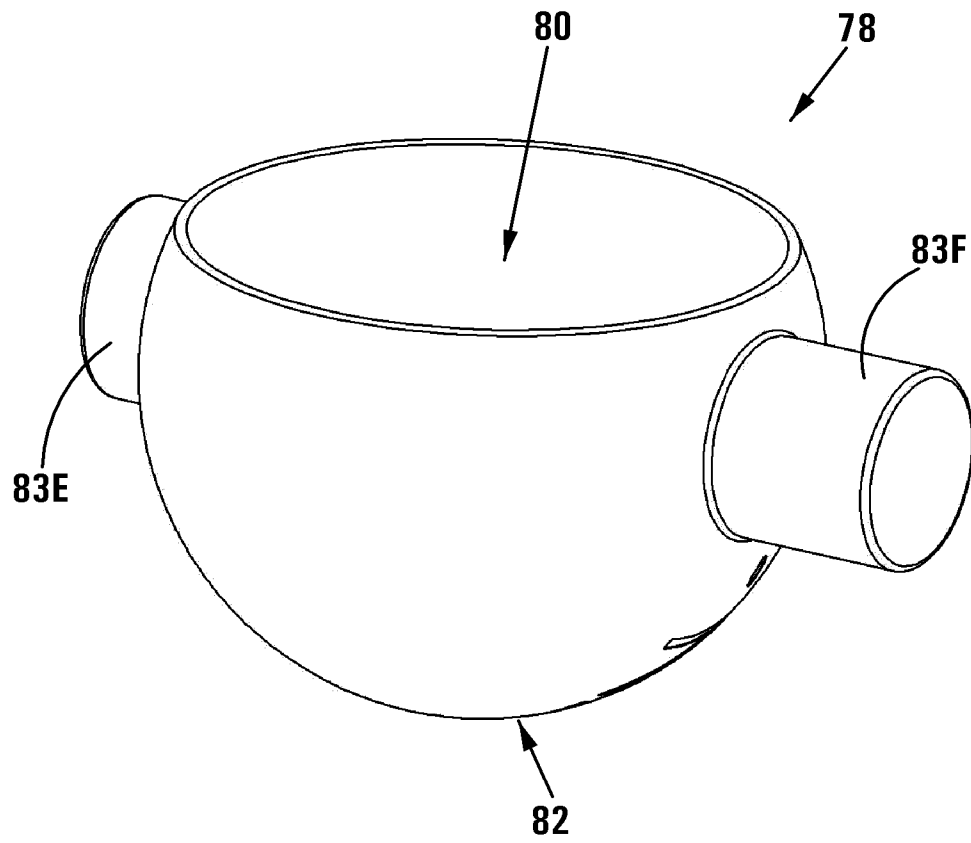
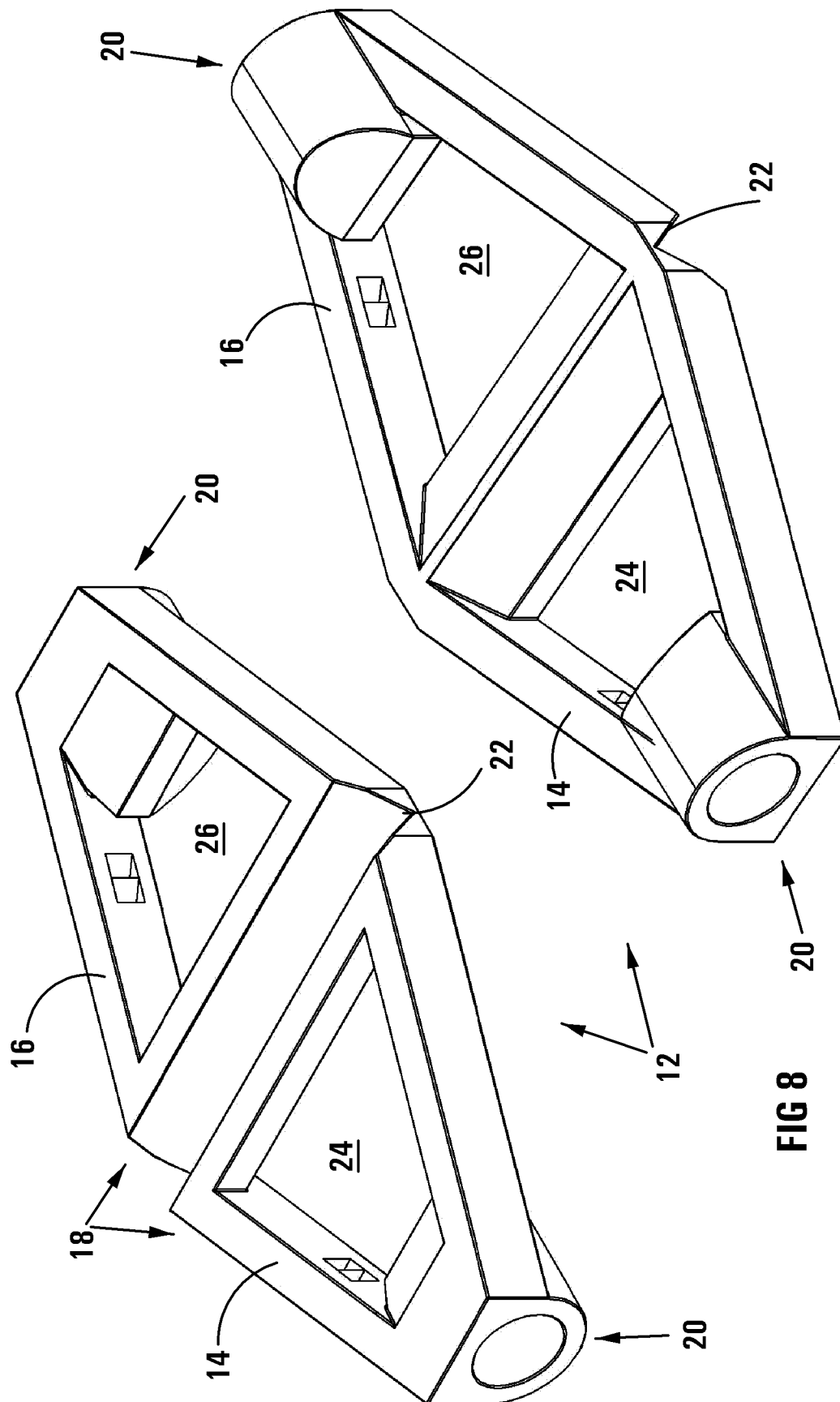
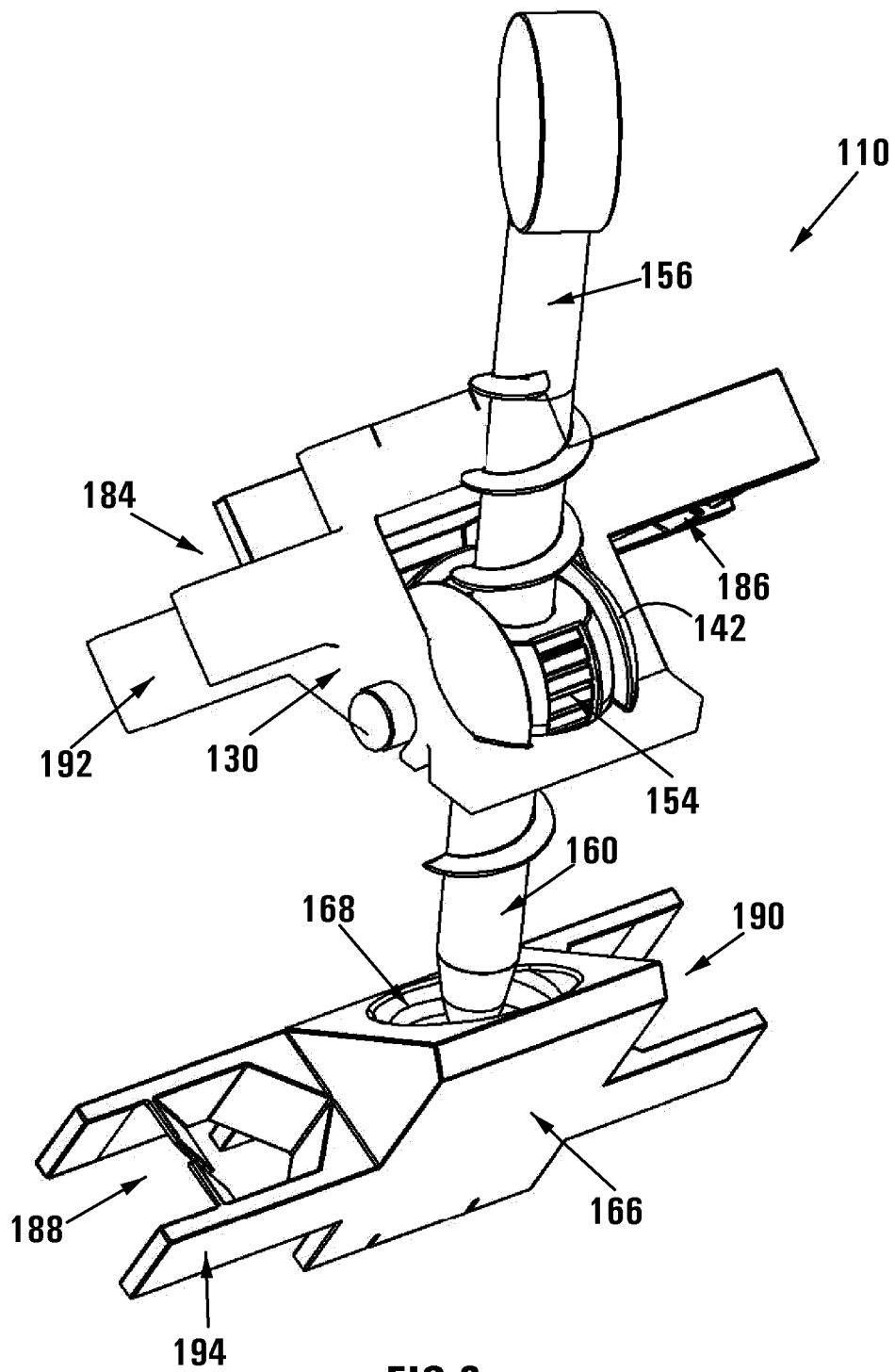


FIG 7





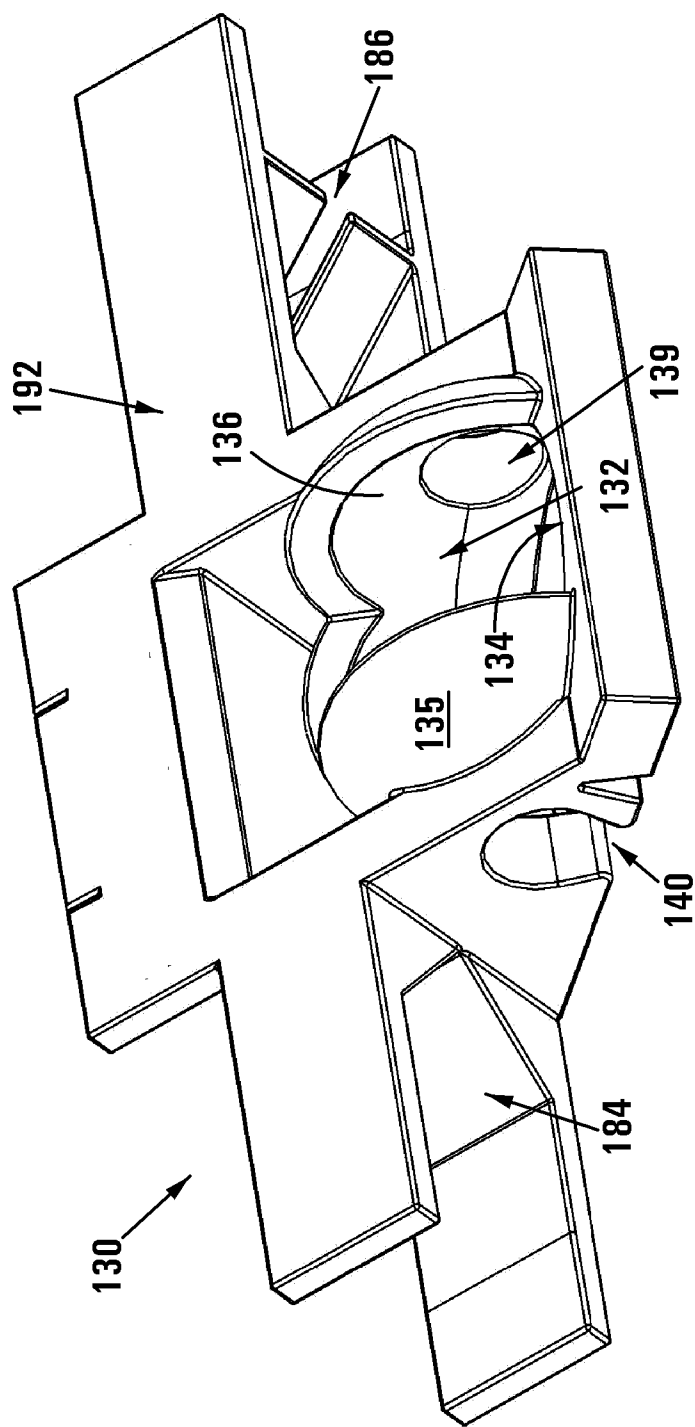


FIG 10

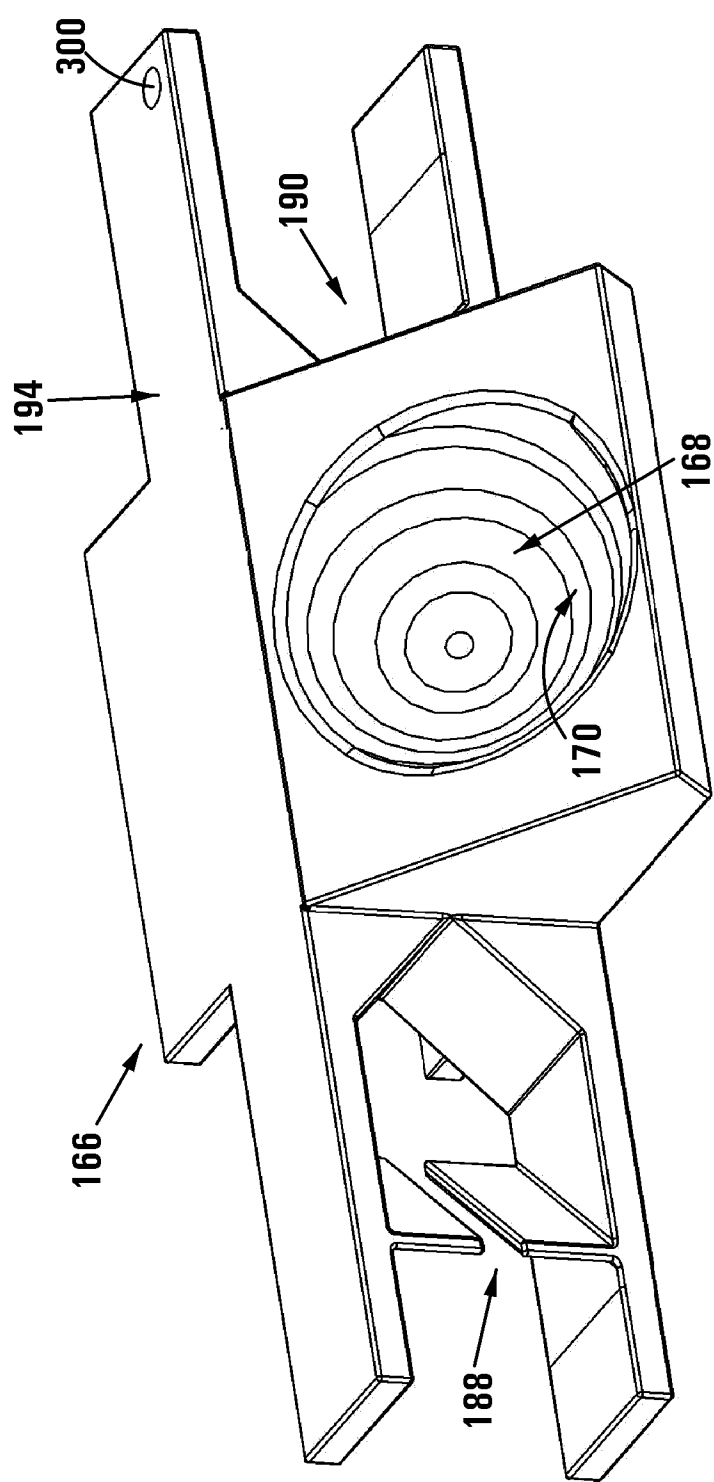


FIG 11

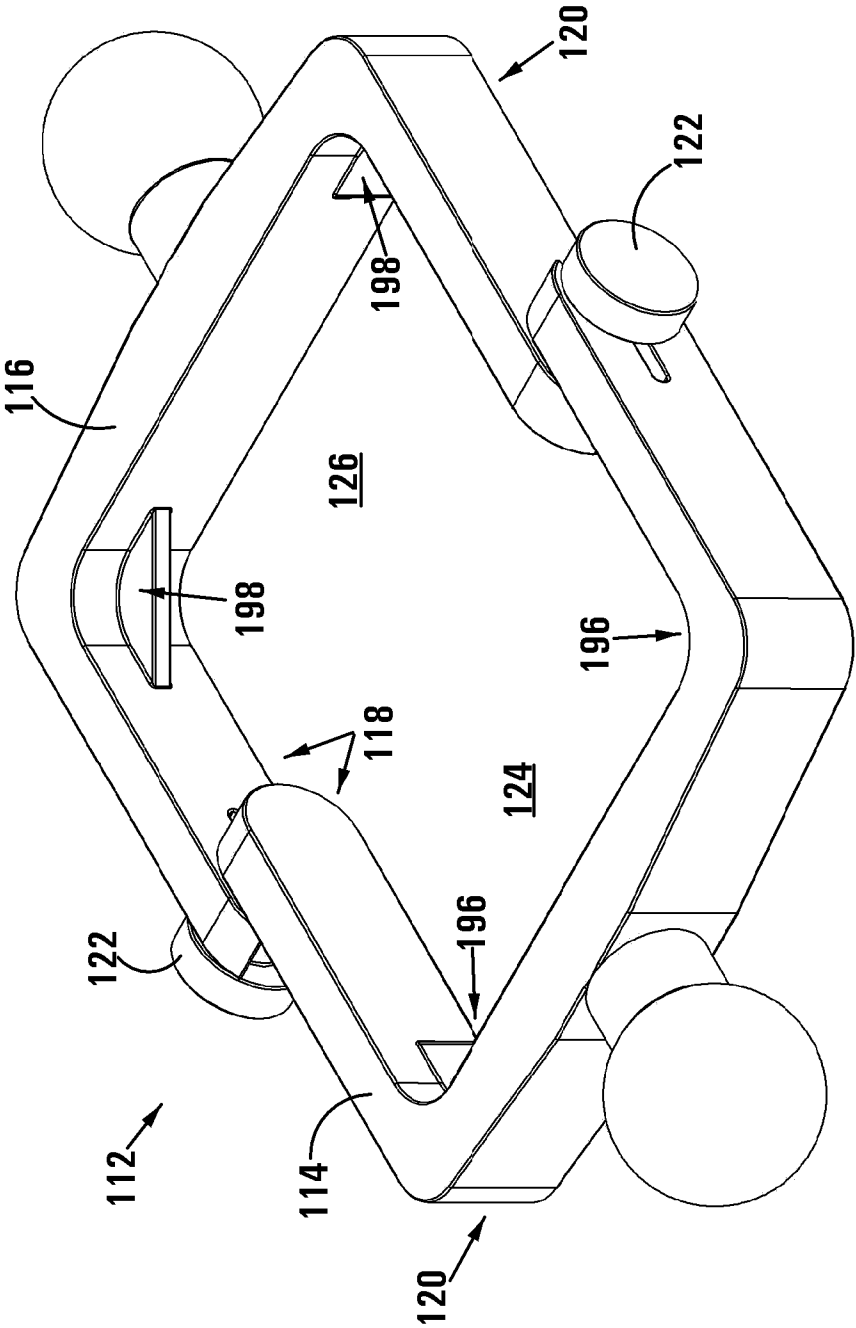


FIG 12

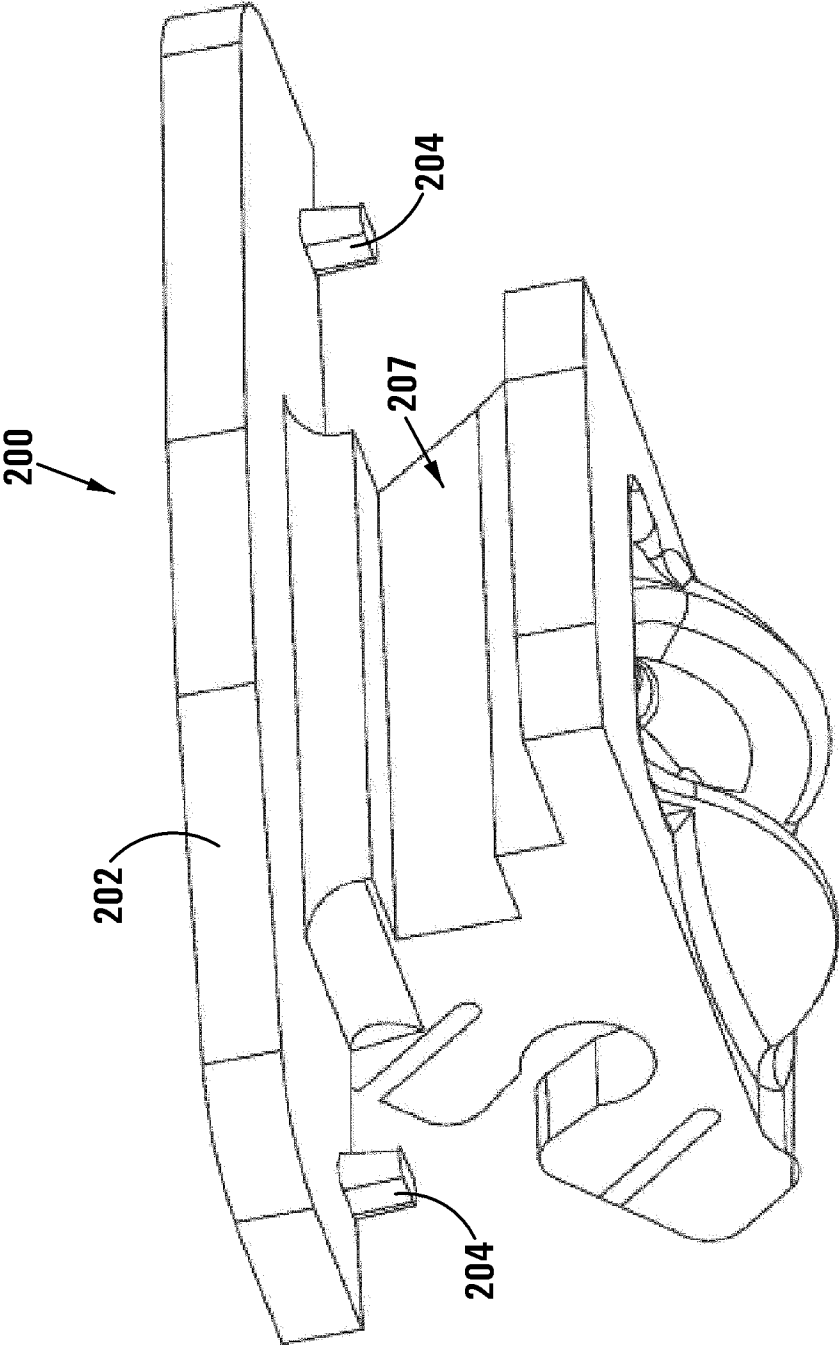


FIG 13

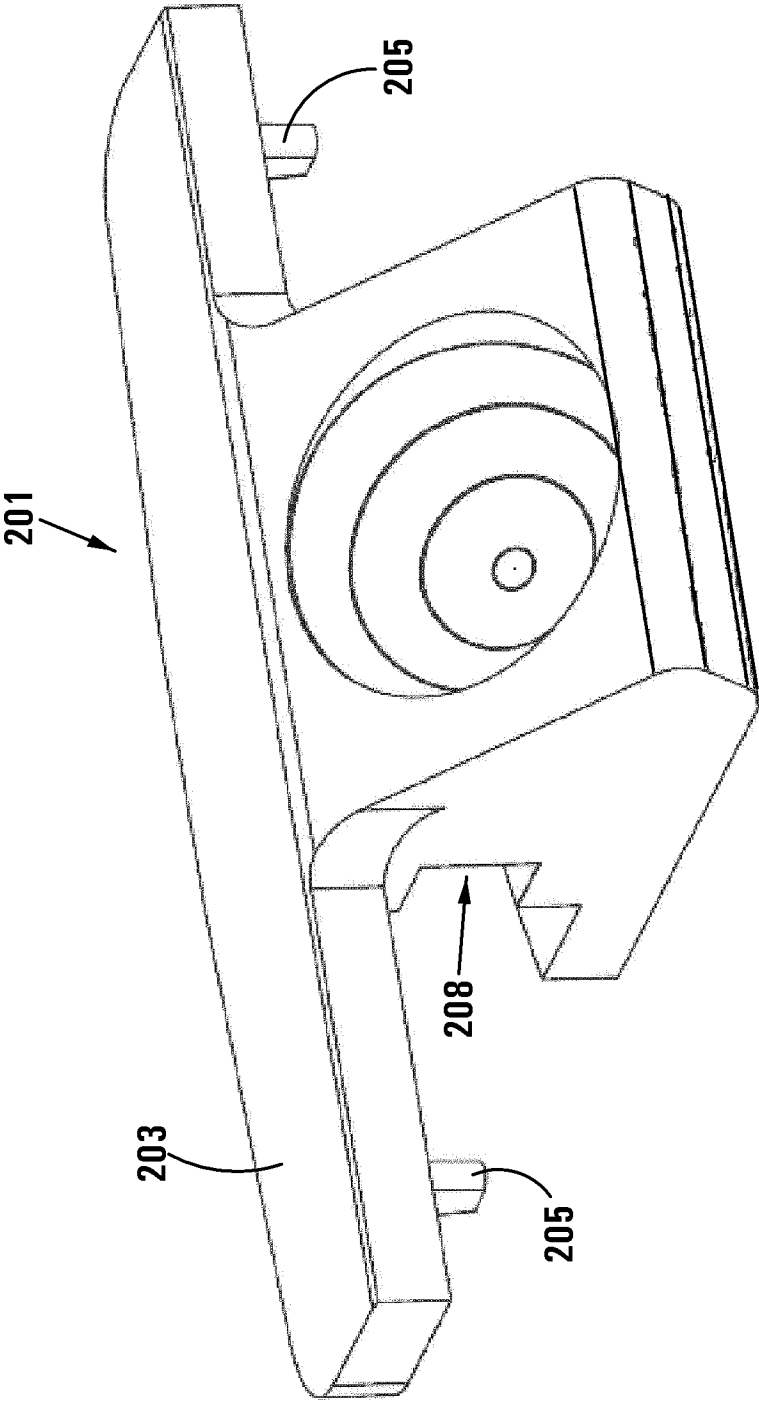
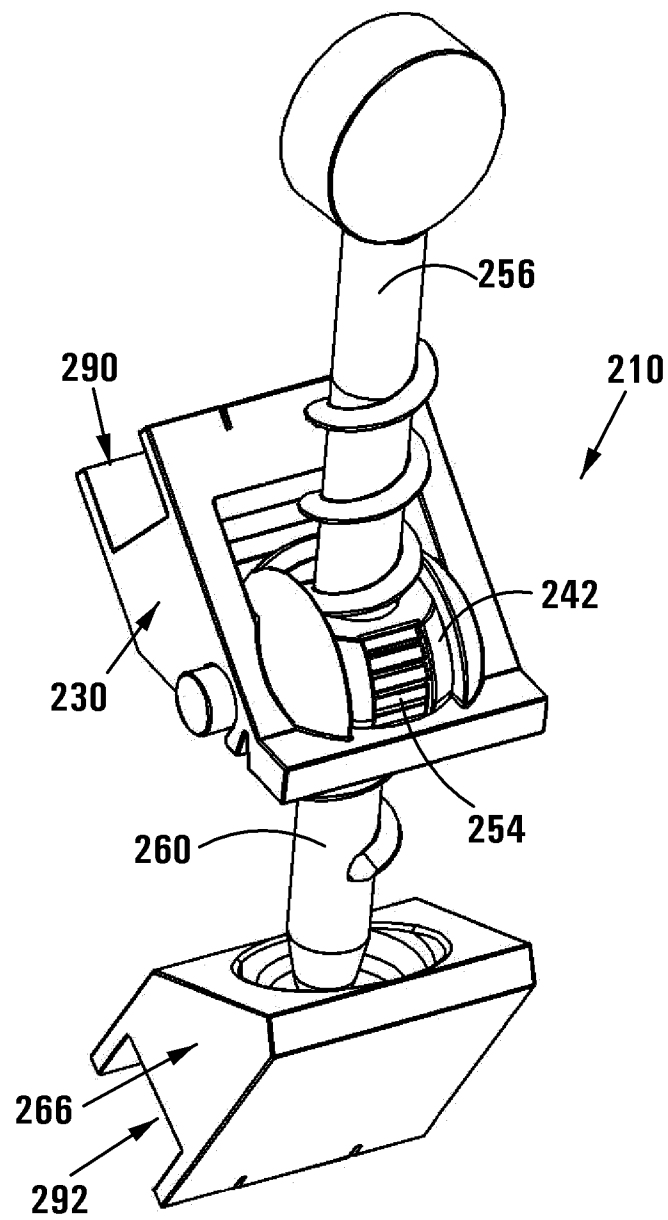


FIG 14

**FIG 15**

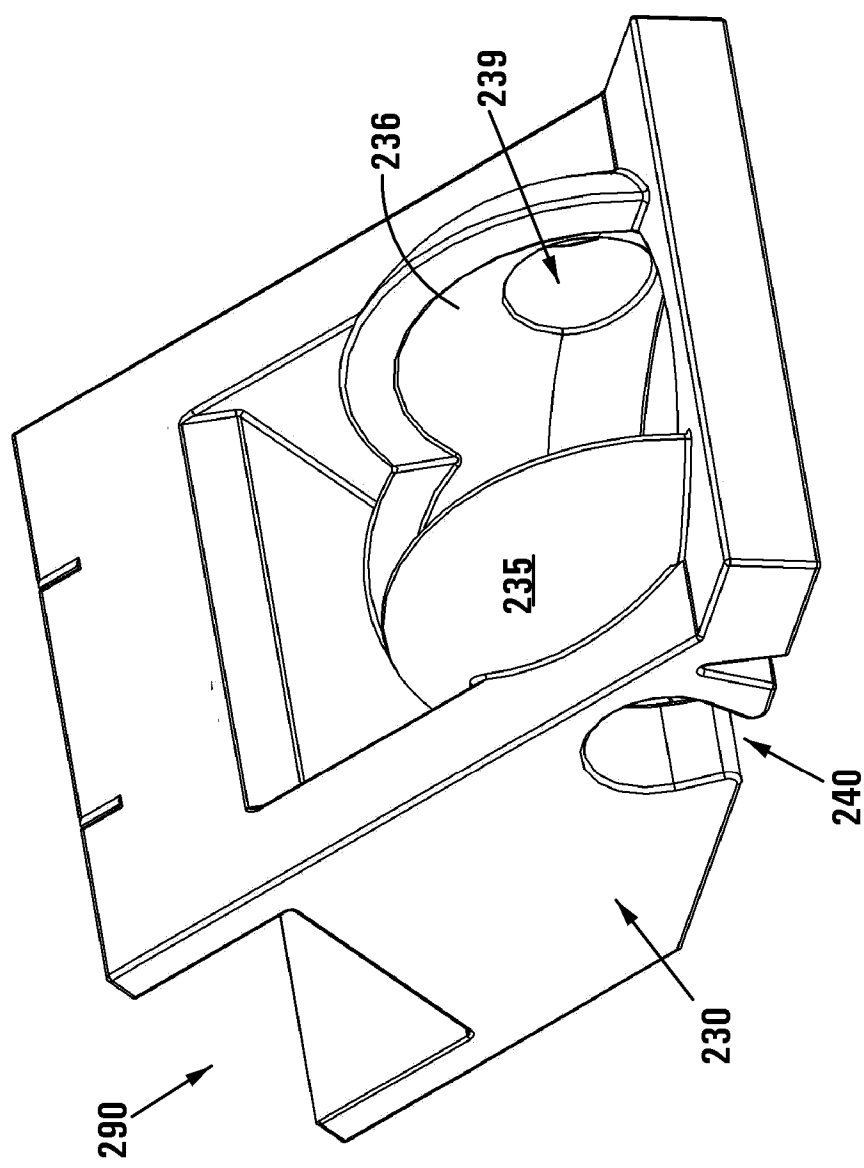
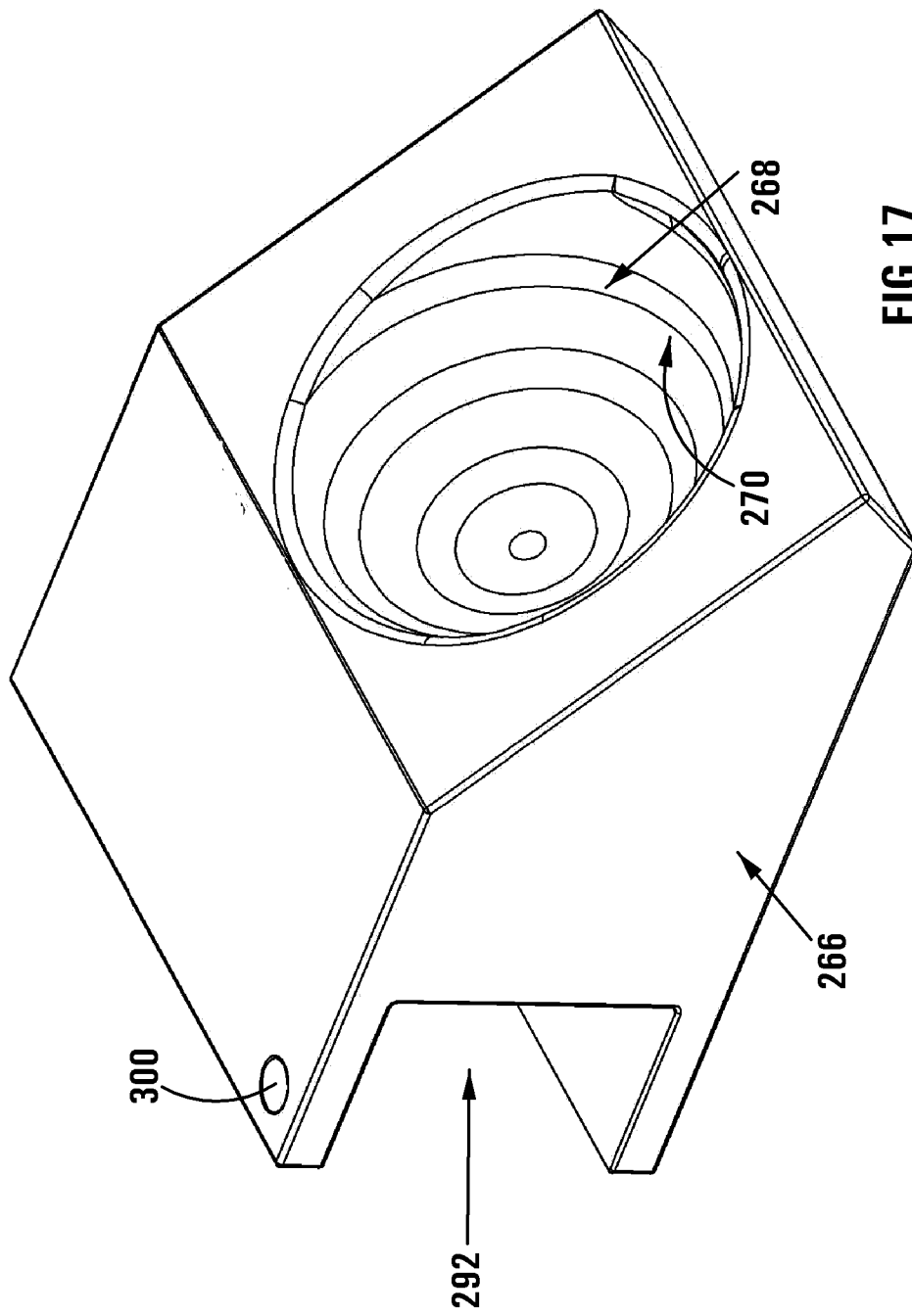


FIG 16



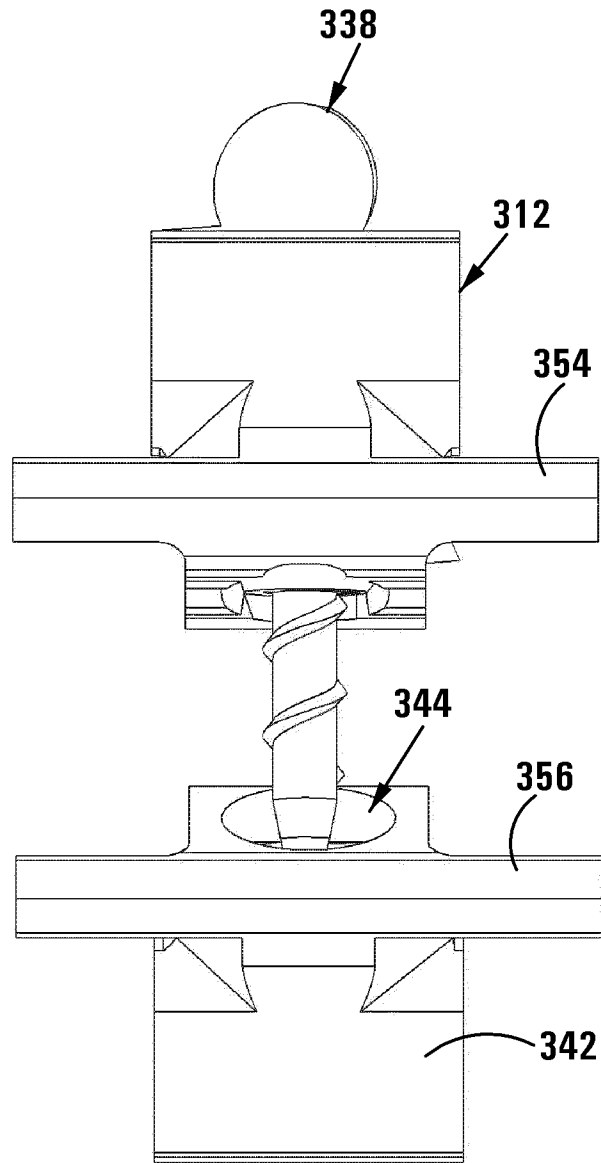
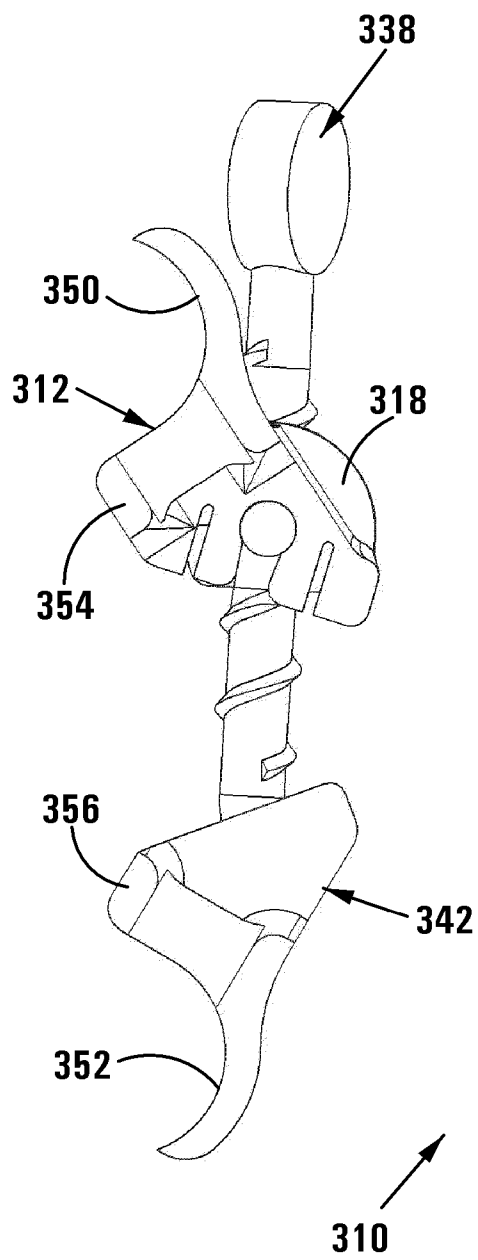


FIG 18

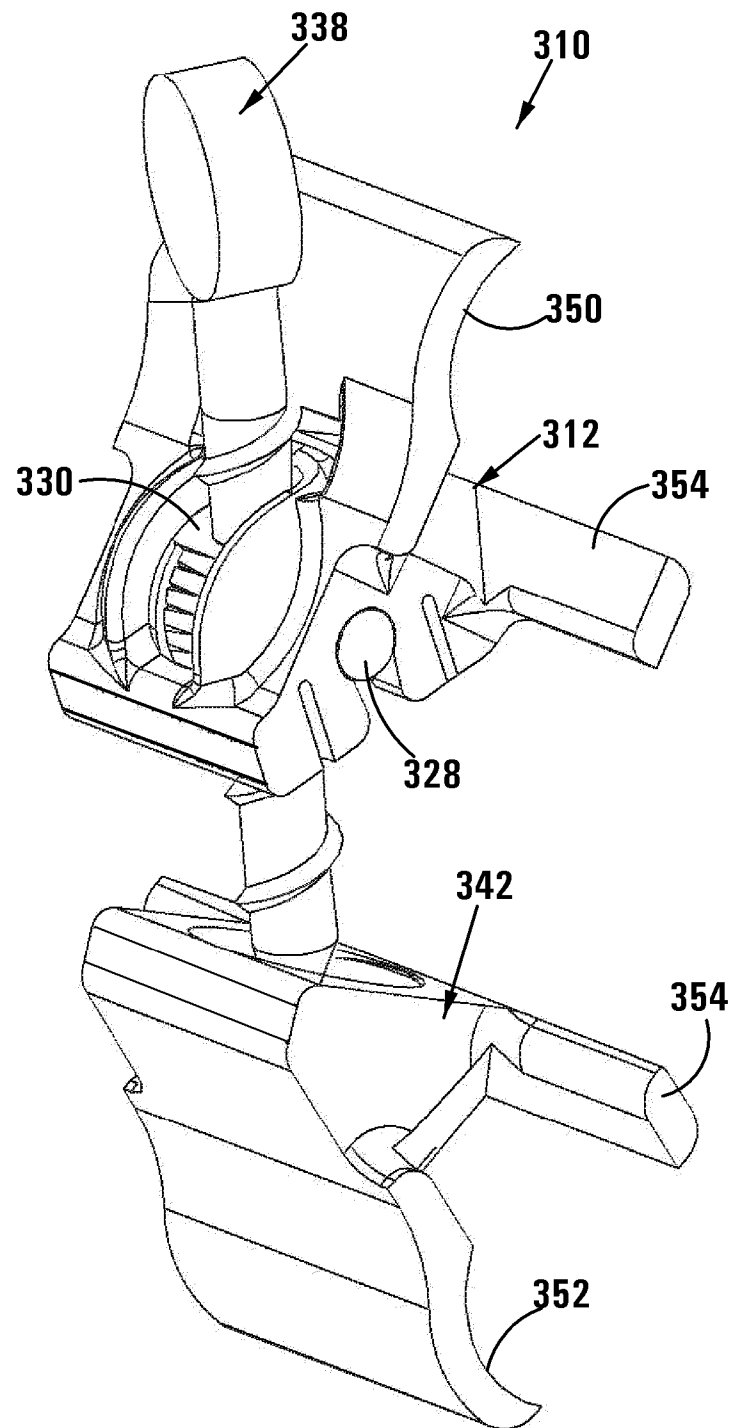


FIG 19

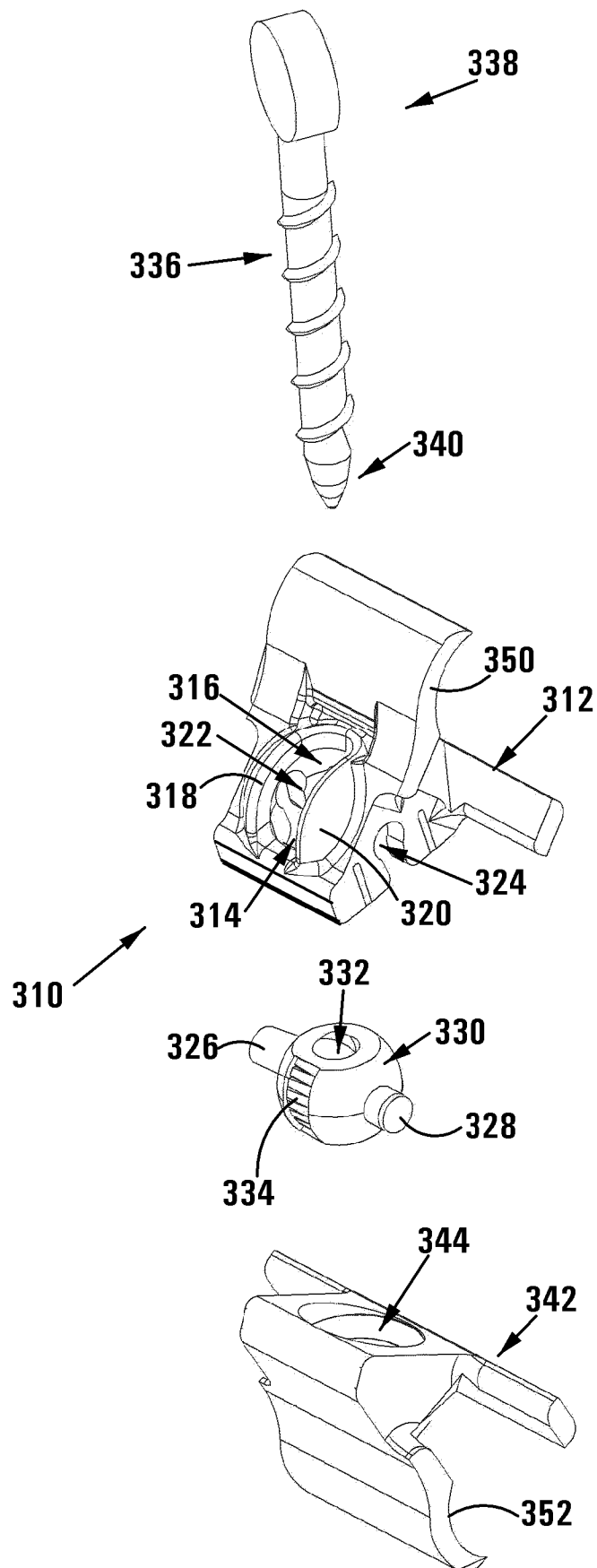


FIG 20

INTERNATIONAL SEARCH REPORT

International application No.

PCT / IB 2013/051304

A. CLASSIFICATION OF SUBJECT MATTER IPC: A61C 11/02 (2006.01) According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) A61C Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, WPI		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE 19530157 A1 (AMANN, DIETMAR) 25 April 1996 (25.04.1996) Abstract; Fig. 2	1-14
A	US 4687442 A (WONG) 18 August 1987 (18.08.1987) Abstract; Fig. 4	1-14
A	JP 2008113717 A (SUWA KENJI) 22 May 2008 (22.05.2008) EPODOC-Abstract [online] [retrieved on 04.06.2013]retrieved from: EPOQUE EPODOC Database; Fig. 8	1-14
A	DE 2511388 B1 (MACK, HEINZ) 20 May 1976 (20.05.1976) Abstract; Fig. 6	1-14
☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 04 June 2013 (04.06.2013)		Date of mailing of the international search report 10 June 2013 (10.06.2013)
Name and mailing address of the ISA/AT Austrian Patent Office Dresdner Straße 87, A-1200 Vienna Facsimile No. +43 / 1 / 534 24-535		Authorized officer HUNGER U. Telephone No. +43 / 1 / 534 24-363

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT / IB 2013/051304

Patent document cited in search report			Patent family member(s)			Publication date
DE	A1	19530157	AT	B	401143	1996-06-25
			DE	A1	19530157	1996-04-25
US	A	4687442	JP	A	S6232947	1987-02-12
			US	A	4687442	1987-08-18
JP	A	2008113717	JP	A	2008113717	2008-05-22
DE	B1	2511388	DE	B1	2511388	1976-05-20
			JP	A	S58130035	1983-08-03