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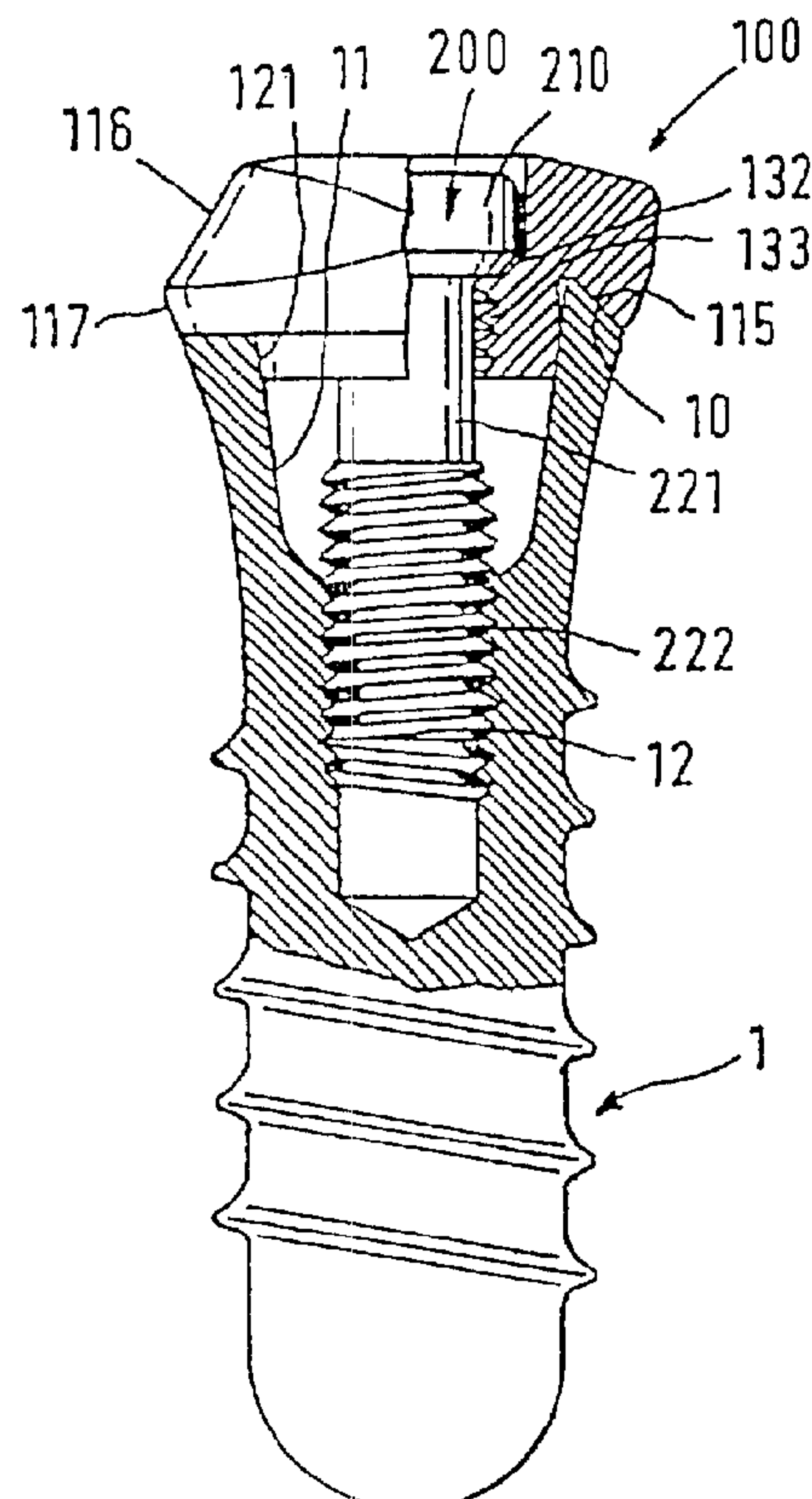
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(54) Title: HEALING CAP FOR A DENTAL IMPLANT



(57) Abrégé/Abstract:

The healing cap (100) proposed is distinguished by a bevel (116), particularly in the region to be positioned labially, which bevel is advantageous for conditioning the soft parts, as well as a firm bearing on the associated implant (1), which is achieved by means of the mating shoulder (115) and an adaptable end portion (121) of the pin (120) or a mere centering bead. The occlusally applicable screw (200) designed can be mounted in the healing cap (100) beforehand, making it easier to handle. A protective cap is conventionally used as an intermediate treatment and as a temporary sealing element.

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Healing Cap for a Dental ImplantField of the Invention

The invention relates to a healing cap which can be fixed on an intraossally positioned dental implant and
5 has a mating shoulder which can be matched to the shoulder of the implant and which lies below the roof part of the healing cap. Furthermore, the invention comprises an occlusally applicable screw for fixing the healing cap on the implant.

10 When inserting an implant into the maxilla or the mandibula, the surgical procedure of intra-ossal implantation in principle ends with the positioning of a special healing cap, before the papillae and the gingiva are repositioned as precisely as possible and are adapted using
15 sutures. These healing caps, which generally consist of a biocompatible material, extend the implant, during the healing phase, which lasts a number of months, as far as the surface of the soft tissue. This thus achieves transgingival incorporation, even though the shoulder of the
20 implant is located subgingivally. Such an insertion depth of the implant is desirable particularly in the case of aesthetic reconstructions, in order that later no implant surface whatsoever remains visible.

In addition to the biocompatibility, healing caps
25 also have to meet requirements with respect to perfect seating, which is as far as possible free of gaps, on the implant, to the protection of the head of the implant, to the shaping of the mucosa and to ease of handling in practice.

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Background of the Invention

Single-part healing caps are known for temporarily sealing ITI[®] implants - the latter have an implant head which widens upwards in the form of a funnel and an uppermost, radially encircling implant shoulder with a bevel angle of 45° (e.g. US-A-5368483). Healing caps of this kind have a head part which is in principle cylindrical and flat and which on the side facing the implant has a hollow which complements the shoulder of the implant. On the top side, there is an engagement contour for a screwdriver, while a threaded pin extends below the top part, which pin can be screwed into the axial inside bore in the implant. If the availability of space requires the use of a healing cap with a smaller head, then a healing cap whose head can be countersunk in the inside cone of the implant is also available. Cf. the illustrations in: Internationales Journal für Paradontologie & Restaurative Zahnheilkunde [International Journal for Periodontology & Reconstructional Dentistry], reprint, Vol. 13, Issue 5, 1993, pages 397 and 414.

The healing caps mentioned to this extent have the drawback that, due to their contour, they do not contribute optimally to preforming the gingiva, and are felt by the patient to be intrusive, particularly in the anterior and posterior regions; the healing caps with a reduced head no longer protect the shoulder of the implant.

Single-part healing caps are also proposed in EP-0,423,798 B1, in the company publication: 3i[®] IMPLANT INNOVATIONS[®] - The Emergence Profile System[®], 1993, and in PRACTICAL PERIODONTICS AND AESTHETIC DENTISTRY, Vol. 5 No. 5, June/July 1993. Although these healing caps may sometimes have a positive effect on the preforming of the

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gingiva, no improvement is achieved in the vestibular region. In addition, these healing caps are generally not suitable for implants with a bevelled shoulder.

Furthermore, two-part healing caps are known,
5 which comprise the healing cap itself and an occlusally applied screw, which can be introduced into the cap head from above and is countersunk therein (referred to below simply as occlusal screw). The occlusal screw penetrates the healing cap centrally and axially, is supported therein,
10 likewise engages in the inside bore provided in the implant and thus presses the healing cap onto the shoulder of the implant. Cf. the illustrations in Schroeder/Sutter/Buser/Krekeler: Orale Implantologie. [Oral Implantology] Georg Thieme Verlag Stuttgart, New York, 2nd
15 Ed., 1994, pages 309f. In addition to the abovementioned disadvantages, these healing caps are extremely tricky to handle, in view of the two small parts - the healing cap and the occlusal screw put in separately.

Object of the Invention

20 To summarize, it can thus be established that all of the healing caps known to date cannot be regarded as optimal. The problem underlying the invention is therefore to provide a healing cap which is distinguished by a firm seating on the implant, advantageous preforming of and
25 bearing on the gingiva, aesthetically satisfactory contouring and manipulation of the papillae - particularly in the noticeable region of the front teeth- and by unproblematical handling.

Summary of the Invention

30 The design principle of the proposed healing cap which can be fixed flush on the implant consists in

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providing on its lateral roof part a bevel which is to be positioned labially and is partly to completely encircling. On the underside, the healing cap has a radially extending recess, so that a mating shoulder which is complementary to the shoulder of the implant is formed. An axially extending, conical pin is provided below the roof part, which pin is complementary to the upper part of the inside bore in the implant. In a preferred embodiment, a threaded bore for receiving an occlusal screw extends axially through the healing cap. The occlusal screw has a screw head which can be countersunk in the top surface of the healing cap and has an inner contour for the attachment of a turning tool. The screw shank, which at the start has a threaded part and near the screw head has a smooth shank part of reduced diameter, runs from the screw head.

The invention now provides a healing cap by means of which the gingiva is shaped into a position which appears natural, i.e. the surrounding soft parts are aesthetically conditioned. Furthermore, the healing cap ensures a firm seating which is as far as possible free of gaps on the implant, and significantly improved handling is provided. When using an occlusal screw, the latter is screwed into the healing cap before the latter is inserted, so that in principle only one part has to be handled. The unthreaded shank part on the occlusal screw allows the latter to be screwed tight freely, without concomitant rotation of the protective cap, since, when the occlusal screw is turned in relatively deeply, the external thread of the screw shank becomes disengaged from the internal thread situated in the healing cap.

In accordance with the present invention, there is provided a healing cap for an intraossally positioned dental implant, comprising: a roof part having a top surface, an

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outer circumferential surface, a lower circumferential shoulder edge, and a conical mating shoulder located on an underside of said roof part, said mating shoulder being of a shape complementary to a shoulder of the implant; a bevel
5 depending from said top surface and positioned on said circumferential surface and extending partly therearound, said bevel ending above said shoulder edge; a chamfer extending downward from said bevel to said shoulder edge; a through-bore extending axially through said healing cap; and
10 a screw inserted into said through-bore, said screw securing said healing cap on the implant.

Brief Description of the Drawings

An exemplary embodiment of the healing cap according to the invention, with associated occlusal screw
15 and protective cap, will be described in detail below with reference to the appended drawings, with possible modifications being mentioned at the end. In the drawings:

Figure 1A: shows a front view of a partial section of the healing cap;

20 Figure 1B: shows a top view of Figure 1A;

Figure 2A: shows a front view of the occlusal screw;

Figure 2B: shows a top view of Figure 2A;

Figure 3A: shows a full screw implant with
25 attached healing cap which is fixed by means of an occlusal screw; and

Figure 3B: shows the representation of Figure 3A with a higher healing cap.

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Description of the Preferred Embodiments

As shown in Figures 1A and 1B, the top, the healing cap 100 has a roof part 110 which in principle is cylindrical and mushroom-shaped and a pin 120 which begins centrally on the underside of this roof part. A through-bore 130 extends axially through the healing cap 100.

The top surface 111 of the roof part 110 is slightly convex and the transition 112 to the outer, radially encircling lateral surface 113 is rounded off. The lateral surface 113 itself is likewise convex and leads onto the circular shoulder edge 114. From the shoulder edge 114 towards the pin 120, there exists a conical surface in the form of a circular ring, which forms the complementary mating shoulder 115 for the shoulder 10 of the implant (cf. Figures 3A and 3B). In the labially positioned region, a bevel 116, which starts at the top surface 111, is provided on the roof part 110, which bevel extends over approximately half the circumference, laterally tapers smoothly and at the bottom ends before reaching the shoulder edge 114, so that a partial chamfer 117 is formed.

The pin 120, at its lower portion 121, is adapted to the inside contour of the implant 1, i.e. it tapers conically here. This conicity matches the inside cone 11 of the implant 1 (cf. Figures. 3A and 3B).

The through-bore 130 has a plurality of different sections. Starting from the top surface 111, first of all a screw-head receiving part 131 with a lower conical seat 132 is provided, on which the complementary cone base 211 of the screw head 210 of the occlusal screw 200 is supported (cf. Figure 2A). An internally threaded section 133, which is of reduced diameter with respect to the screw head receiving

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part 131 and opens out on the underside 122 of the pin 120, extends downwards from the conical seat 132.

The following stipulation applies to the whole of the rest of the description. If, for the purpose of
5 unambiguous representation, reference numerals are included in a figure but are not explained in the directly associated text of the description, reference is made to where they have been mentioned in preceding descriptions of figures.

As shown in Figure 2A and 2B, at the top, the
10 occlusal screw 200 has the thickened screw head 210, on the upper side of which an engagement contour 212 for a complementary turning tool is provided. The conical base 211 corresponding to the conical seat 132 is situated on the underside of the screw head 210. The screw shank 220, which
15 is divided into a smooth shank part 221 and into a threaded part 222, extends axially downwards from the screw head 210. The shank part 221 adjoins the conical base 211 and is in turn adjoined by the threaded part 222, the latter having a wider diameter than the smooth shank part 221 and a reduced
20 diameter compared to the screw head 210.

As illustrated in Figure 3A, the healing cap 100 is placed on the implant 1 - in this case a full screw implant - and fixed by means of an occlusal screw 200. In this case, the mating shoulder 115 of the healing cap 100 is
25 seated on the shoulder 10 of the implant, the screw head 210 is supported in the through-bore 130 on the conical seat 132 and the threaded part 222 of the occlusal screw 200 engages into the internal thread 12 situated in the implant 1. The conical portion 121 of the pin 120 fits into the inside cone
30 11 in the implant 1 and thus centres the healing cap 100 on the implant 1.

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As illustrated in Figure 3B, for certain anatomical features or for an implant 1 which is positioned more deeply, a healing cap 100 with a higher roof part 110 is available. The bevel 116 and the length of the through-bore 130 are enlarged accordingly. It is also possible to allow the internally threaded section 133 in the healing cap 100 to end even before emerging from the underside 122, the bottom section of the through-bore 130 then being smooth.

As a rule, following an healing phase of about seven weeks, the healing cap 100 according to the invention is replaced by a conventional healing cap, in order to provide further conditioning of the gums. Impression-taking can be carried out after the end of the entire healing phase. A protective cap is conventionally used as a temporary provision for filling the gap between the teeth or the sulcus and as a protection for the shoulder 10 of the implant.

Further structural variations can be carried out on the above-described healing cap 100. Expressly mentioned here are:

To simplify production, the bevel 116 may be provided so as to encircle the healing cap 100 completely.

The bevel 116 may further have a configuration in which the opposite half-sides of the roof part 110 are bevelled partially or adjacently to one another.

Instead of the occlusal screw 200, other practicable positively-locking or non-positively-locking means may also be used to fix the healing cap 100 on the implant 1, which may make the through-bore 130 superfluous.

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The pin 120 could be shortened to such an extent that, in the transition to the mating shoulder 115, a mere centering bead 118 is formed.

The healing cap 100 may in principle be of round
5 or oval configuration or be configured with additional bulges and indentations.

The engagement contour 212 in the screw head 210 may have a cross slot, a polygon or a conventional non-rotationally symmetrical contour.

10 The foregoing description of preferred embodiments is intended merely to exemplify the working of the invention and should not be construed as limiting the scope of the invention which is defined solely by the claims appended hereto.

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CLAIMS:

1. A healing cap for an intraossally positioned dental implant, comprising:

5 a roof part having a top surface, an outer circumferential surface, a lower circumferential shoulder edge, and a conical mating shoulder located on an underside of said roof part, said mating shoulder being of a shape complementary to a shoulder of the implant;

10 a bevel depending from said top surface and positioned on said circumferential surface and extending partly therearound, said bevel ending above said shoulder edge;

a chamfer extending downward from said bevel to said shoulder edge;

15 a through-bore extending axially through said healing cap; and

a screw inserted into said through-bore, said screw securing said healing cap on the implant.

2. A healing cap (100) according to claim 1, characterized in that the bevel (116) extends over
20 approximately half the radial circumference of the circumferential surface (113) and laterally tapers smoothly.

3. A healing cap (100) according to claim 1, characterized in that

25 a) an axial pin (120) starts on the underside of the roof part (110), at least the end portion (121) of which pin is of complementary configuration to the inner contour (11) of the implant (1), and

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b) the mating shoulder (115) in the form of a circular ring extends between the shoulder edge (114) towards the start of the pin (120), and

5 c) a screw head receiving part (131) for an occlusally applicable screw (200) is situated inside a through-bore (130) and has a conical seat (132) and an internally threaded section (133) located below this seat, and

10 d) the transition (112) from the top surface (111) to the circumferential surface (113) is rounded off, the lateral surface (113) apart from the bevel (116) having a convex contour.

4. A healing cap (100) according to claim 3, characterized in that the pin (120) is of frustum-like shape, a mere centering bead (118) being formed in a
15 transition from the pin to the mating shoulder (115).

5. A healing cap (100) according to claim 1, characterized in that an occlusally applicable screw (200) for fixing the healing cap (100) on the implant (1) is provided and the screw (200) has an unthreaded shank part
20 (221) on its screw shank (220), below the screw head (210), which unthreaded shank part is also of reduced diameter with respect to the terminating threaded part (222).

6. A healing cap (100) according to claim 5, characterized in that

25 a) a conical base (211) complementary to the conical seat (132) is provided at the transition of the screw (200) between the screw head (210) and the screw shank (220), and

b) the upper side of the screw head (210) has a recessed engagement contour (212) for attaching a turning tool.

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7. A healing cap (100) according to claim 1, characterized in that the bevel (116) extends over more than half of said circumferential surface.

8. A healing cap according to claim 7, wherein the
5 bevel extending over more than half of said circumferential surface is such that the bevels of half sides of the roof part lying opposite with respect to each other are arranged adjacent to each other.

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PATENT AGENTS

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FIG. 1A

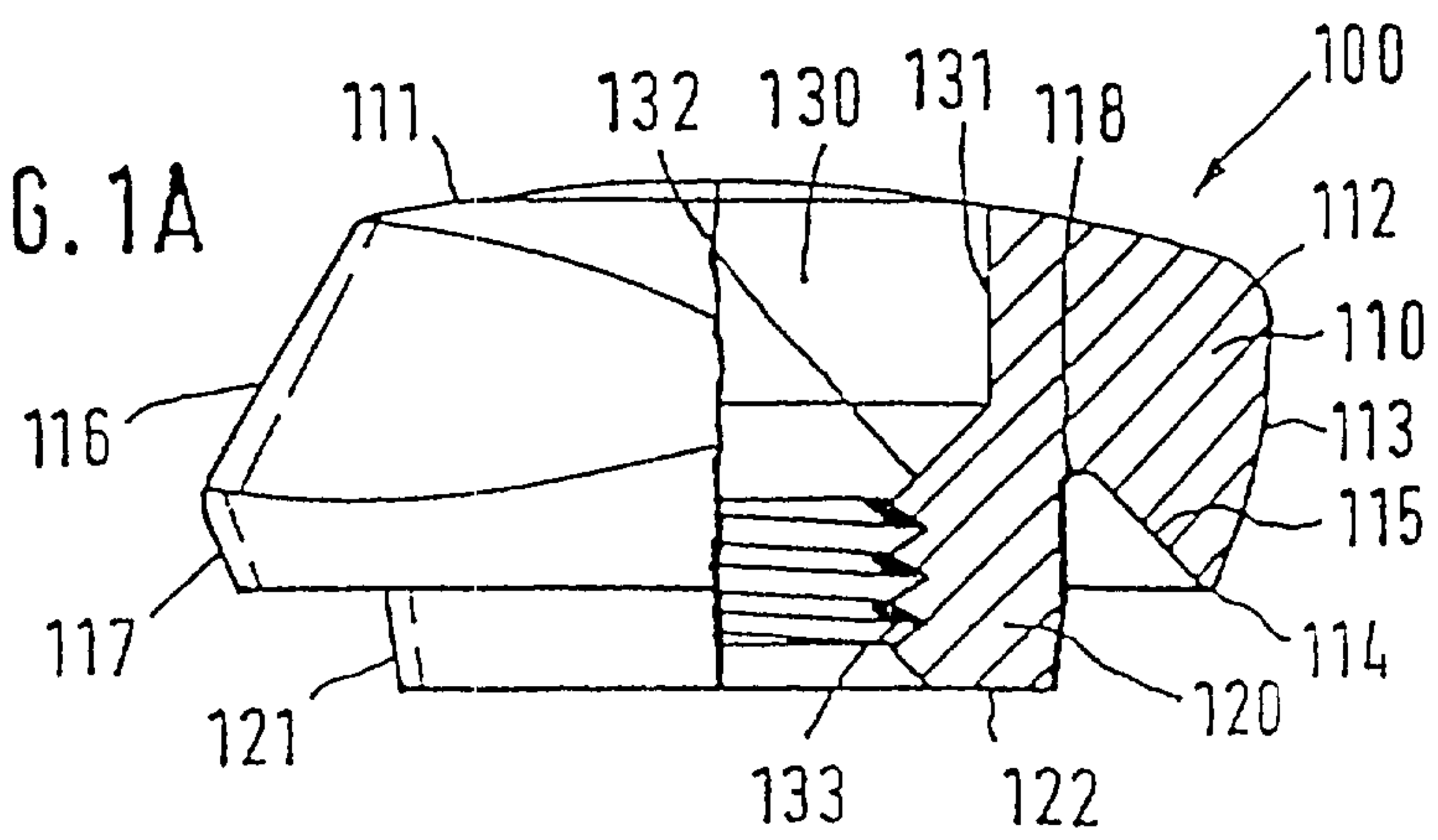


FIG. 1B

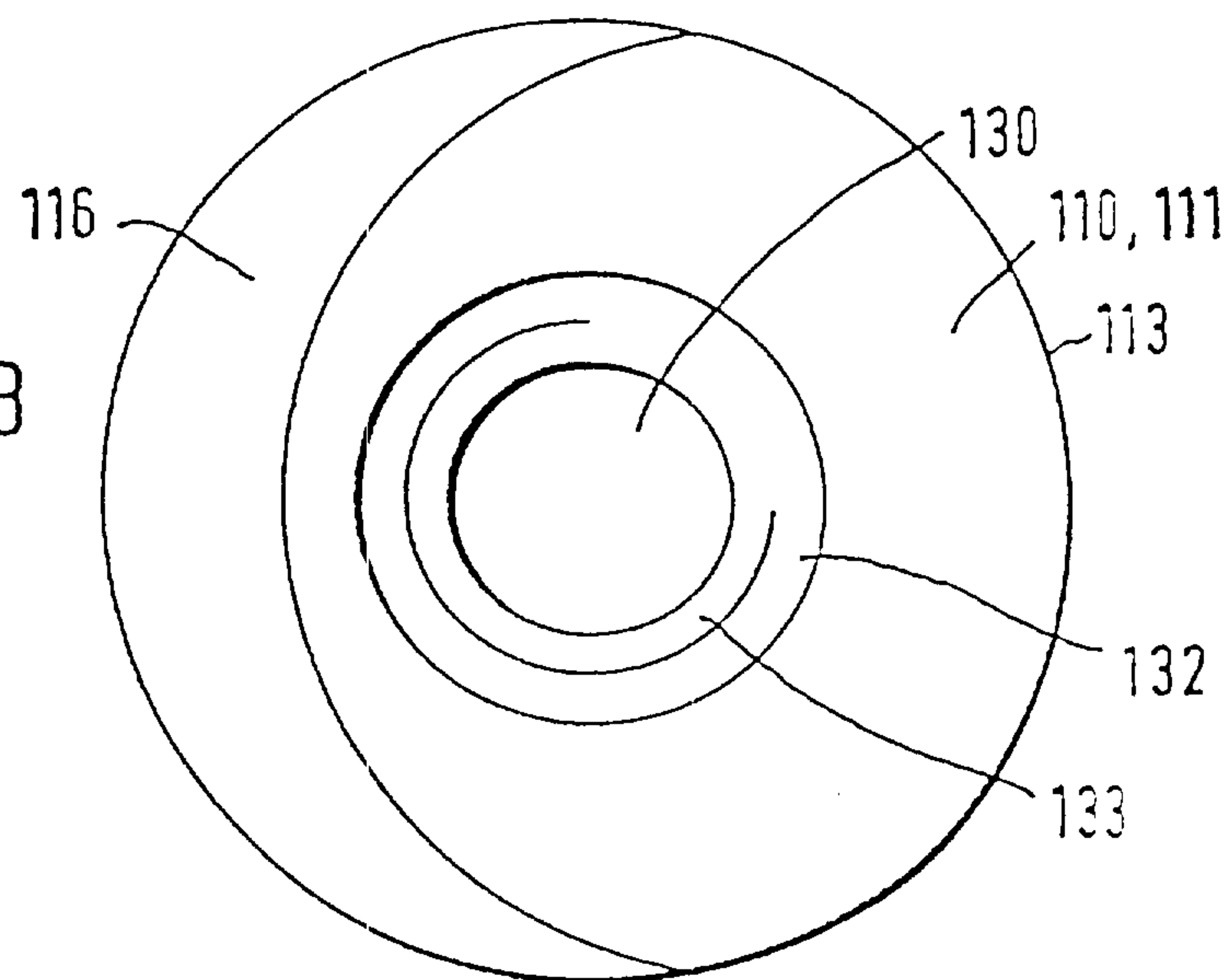


FIG. 2A

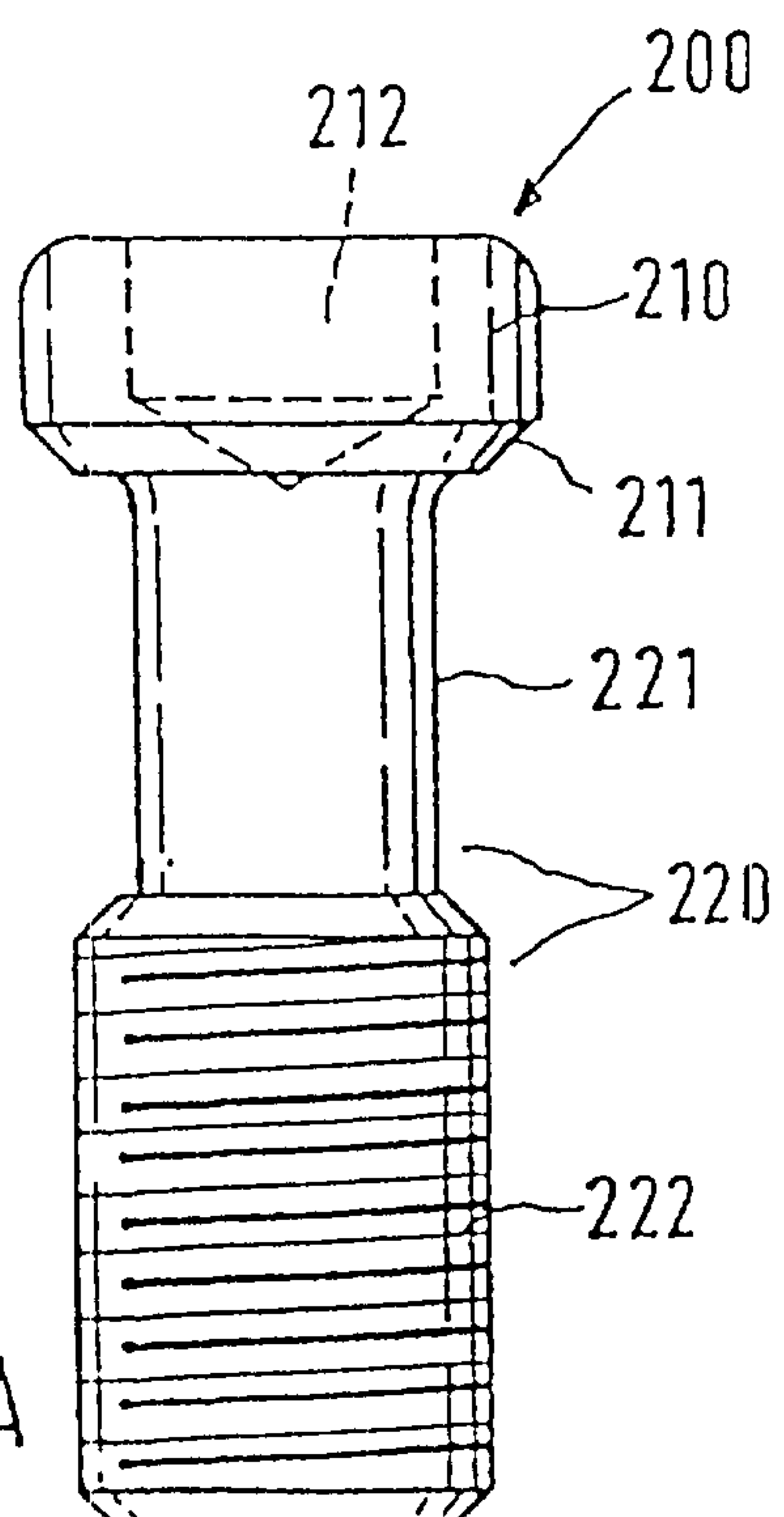
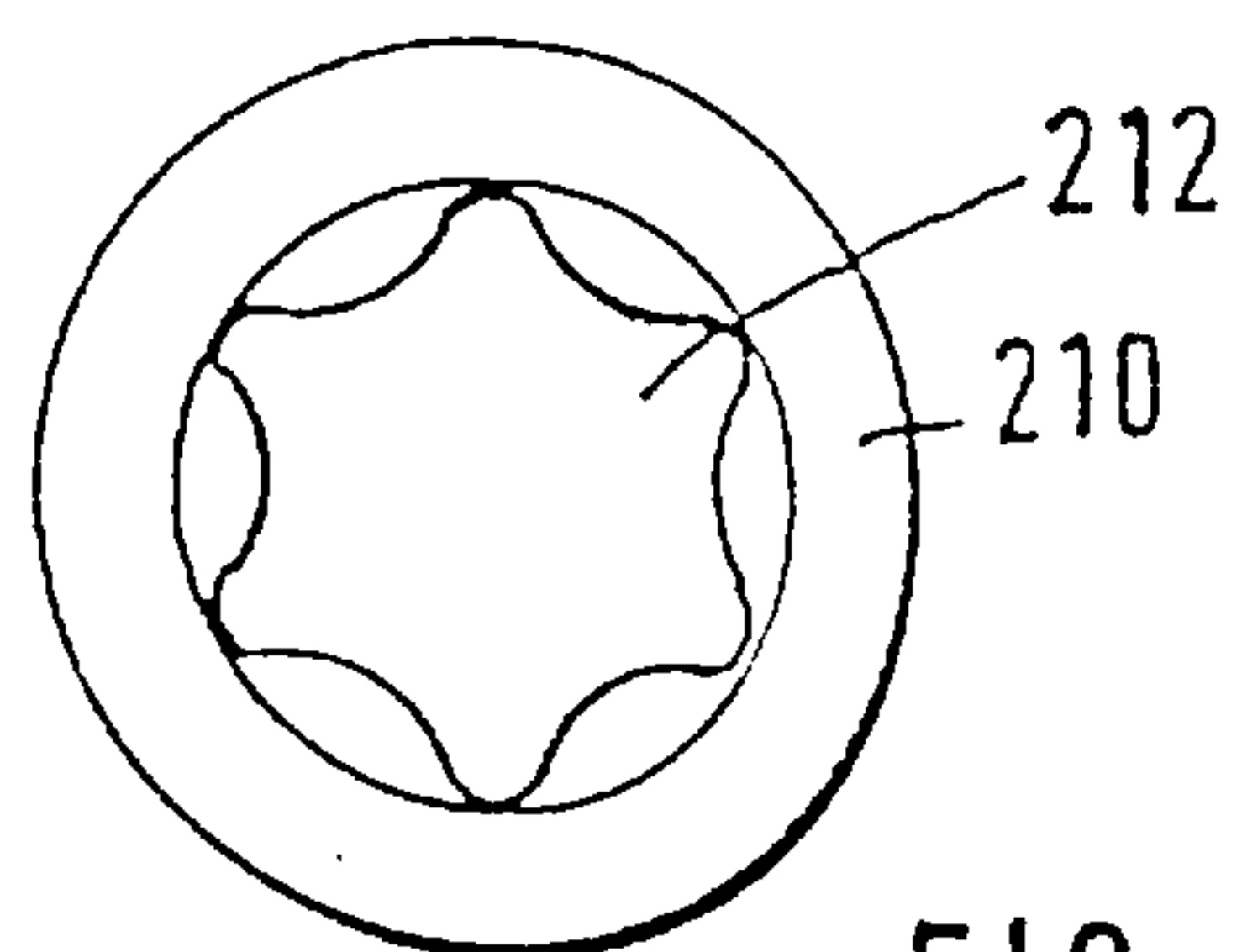


FIG. 2B



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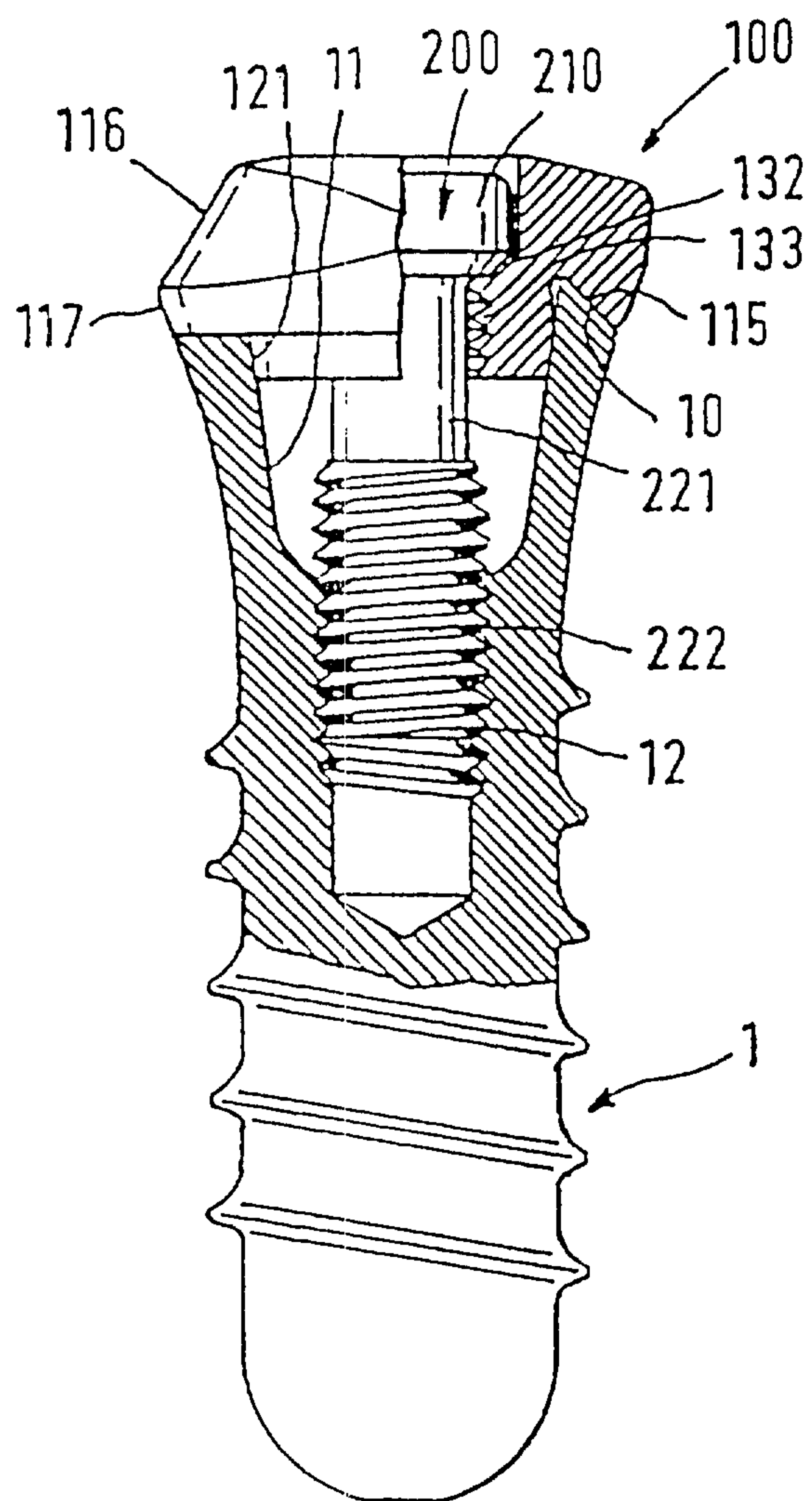


FIG. 3A

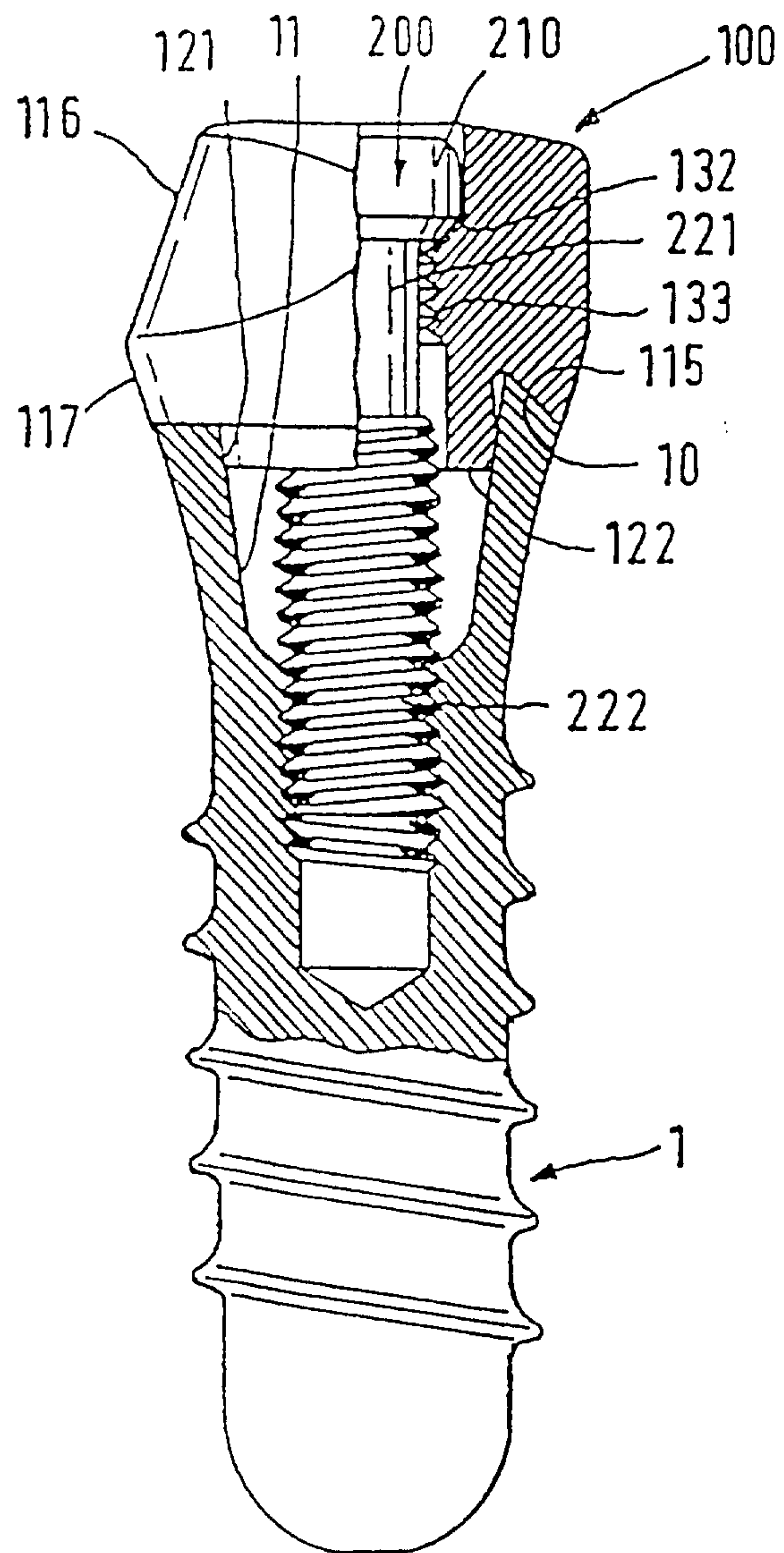


FIG. 3B

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