

The invention relates to an endosseous single tooth implant comprising a securing head, a post for screwing to a base member, and metal devices for securing a stationary, optionally removable dental prosthesis and comprising a metal spacer sleeve which has a centring collar and can be screwed into the open end of the base member, and has a shoulder for placing on the top edge of the base member, the post being screwable into the spacer sleeve. The invention also relates to a tool for use on an aforementioned individual tooth implant.

Endosseous implants of the kind described, e.g. as per EP-OS 2 216 031, have given excellent results in practice. When used as individual tooth implants, however, there is a difficulty in that the dental prosthesis cannot be reliably prevented from twisting relative to the base member unless the individual parts of the implant and the dental prosthesis are stuck together. But this causes difficulties e.g. if the dental prosthesis or the implant post is subsequently replaced, e.g. after failure through breakage.

The aim of the invention is to provide an endosseous individual implant of the kind according to the preamble, such that the dental prosthesis is prevented in reliable and simple manner from twisting relative to the base member, but can be released when required.

To this end, according to the invention, the spacer sleeve has a bottom part having an external thread for screwing into the base member and a ring nut-like top part which, via the shoulder can be placed on the top edge of the base member, the top part having an inner lock thread having a substantially smaller pitch than the insertion thread and screwable on to a corresponding outer thread formed on and near the top edge of the bottom part, and tool attachment means are provided on the top end face of the bottom part and the top part for simultaneously securing the bottom part against twisting after being screwed into the base member and for preventing the top part from twisting relative to the bottom part by pressing the shoulder against the top edge of the base member.

Optionally, the tool attachment device provided on the end face of the bottom part has a diametrically extending web.

In another embodiment of the invention, the tool attachment means provided on the end face of the top part has two diametrically opposite grooves.

According to another optional feature of the invention, the inner bore of the bottom part for receiving the post is formed near its top edge with a centring thread for attaching a tool.

The invention also proposes a tool for use on an individual tooth implant according to the invention, characterised by a bottom-part key complementary with the tool attachment device provided on the end face of the bottom part and a top-part key rotatable relative to the bottom-part key and complementary relative to the tool attachment device provided on the end face of the top part.

A centring screw which extends concentrically through the bottom-part key and the top-part key for insertion in the centring thread of the bottom part can be provided according to the invention.

According to another proposed feature, in the case of a tool of the claimed kind, the centring screw can be actuated by means of a milled head.

According to a final optional feature of the tool as per the invention, the bottom-part key and the top-part key have securing levers extending substantially at right angles to the axis of their relative rotation.

The invention is based on the surprising discovery that a single tooth implant can be reliably locked or prevented from rotating if the spacer sleeve or "insert", made preferably of titanium, is constructed in two parts in the manner claimed. The ring nut-like top part of the spacer sleeve, which has a shoulder abutting the top annular shoulder of the base member, is rotatable relative to the bottom part of the spacer sleeve, by means of the lock nut having a very flat pitch, or can be "screwed" relative to the bottom part. As soon as the two-part spacer sleeve has been screwed into the base member, the top part rotates slightly relative to the bottom part, e.g. by 30°, with the result that the shoulder on the ring groove-like top part is strongly pressed against the bottom edge of the base member, which locks it relative to the bottom part of the spacer sleeve. The single tooth implant is reliably secured by this means.

Embodiments of the invention will now be explained in detail with reference to the diagrammatic drawings, in which:

Fig. 1 shows a first embodiment of an individual tooth implant according to the invention, in section along the longitudinal axis;

Fig. 2 shows the spacer sleeve and the post of the individual implant in Fig. 1 in plan view, seen from the direction of the dental prosthesis to be inserted;

Fig. 3 is a section along line III in Fig. 2;

Fig. 4 shows another embodiment of the single-tooth implant according to the invention, in a view corresponding to Fig. 1, and

Fig. 5 is a view in section through the longitudinal central axis of a tool for use on an individual tooth implant of the kind shown in Fig. 4.

As Fig. 1 shows, the individual tooth implant, in the embodiment shown, has a base member 10 of known kind, e.g. of titanium coated with hydroxyl apatite, and into which the bottom part 12 of a spacer sleeve is screwed, whereas a top part 14 of a spacer sleeve is screwed on to the bottom part. The top part 14 has a shoulder 15 abutting a top edge of the base member 10. An implant post 16 is inserted into an inner bore in the bottom part 12 of the spacer sleeve. The bottom part 12 is inserted into the base part 10 via a thread 17 which has a pitch considerably steeper than the very flat pitch of a lock-nut 18, which is provided between the bottom part 12 and the top part 14. A pin 20 for mounting a dental prosthesis is rigidly connected to the implant post 16.

As also shown in Fig. 1, a diametrically web 22 for attaching a tool is provided on the top end face of the bottom part 12 as described hereinafter, whereas grooves 24 are provided for the same purpose on the end face of the top part 14 facing the dental prosthesis 20. As shown in Fig. 2, four grooves 24 offset from one another by an angle of 90° co-operate to form a tool attachment device. Fig. 3 additionally illustrates the matters previously discussed.

Fig. 4 shows an embodiment which differs from that in Figs. 1 - 3 only in that in Fig. 4, in the top region

of the inner bore of the bottom part 12, a centring thread 26 is provided, the purpose of which will be described hereinafter.

As Fig. 5 shows, the tool according to the invention, in the embodiment shown in Fig. 5, has a milled head 28 which is permanently secured to a centring screw 30 which, when the tool is used, is adapted for screwing into the centring thread 26 of the bore inside the bottom part 12. A bottom-part key 32 is complementary with the web 22 on the bottom part 12, whereas a top part key 34 is complementary with the grooves 24 on the top part 14.

The procedure according to the invention, or for locking the individual tooth implant, is as follows:

Firstly the insert comprising the bottom part 12 screwed to the top part 14, both parts made of titanium, is screwed in conventional manner into the base member 10. As soon as the shoulder 15 abuts the top edge of the base member 10, the implant is locked, i.e. prevented from rotating, in the following manner: the centring screw 30 screws the tool into the centring thread 26 until the bottom-part key 32 has come into engagement with the web 22 and the top-part key 34 has come into engagement with the grooves 24. Small levers, preferably disposed at right angles to the axis of rotation of the two keys, prevent the bottom part 12 from rotating but also rotate the top part 14 slightly, e.g. by 30° or half a revolution, relative to the bottom part. By this means the top part 14 is locked, as if by a differential thread, relative to the bottom part 12 via the base member, against which the shoulder 15 of the top part 14 presses.

Another advantage of constructing the tool attachment device in the form of a web 22 on the bottom part 12 is that if the post 16 breaks at this place, after being inserted, e.g. screwed, into the spacer sleeve after being locked in the manner previously described, it is possible to grip underneath the tool attachment web 22, with the result that the spacer sleeve can be unscrewed from the base member 10, even after the post 16 breaks, and consequently the implant can as it were be repaired without removing the base member 10 from the jaw.

List of reference signs

- 10 Base member
- 12 Bottom part of spacer sleeve
- 14 Top part of spacer sleeve
- 15 Shoulder
- 16 Post of implant
- 17 Insertion thread
- 18 Lock-thread
- 20 Pin for installing the dental prosthesis
- 22 Attachment web
- 24 Attachment grooves
- 26 Centring thread
- 28 Milled head
- 30 Centring screw
- 32 Bottom-part key
- 34 Top-part key



C L A I M S

1. An endosseous single tooth implant comprising a securing head, a post (16) for screwing to a base member (10), and metal devices for securing a stationary, optionally removable dental prosthesis and comprising a metal spacer sleeve (12, 14) which has a centring collar and can be screwed into the open end of the base member, and has a shoulder (15) for placing on the top edge of the base member, the post being screwable into the spacer sleeve, characterised in that the spacer sleeve has a bottom part (12) having an external thread (17) for screwing into the base member (10) and a ring nut-like top part (14) which, via the shoulder (15), can be placed on the top edge of the base member (10), the top part (14) having an inner lock thread (18) having a substantially smaller pitch than the insertion thread (17) and screwable on to a corresponding outer thread formed on and near the top edge of the bottom part (12), and tool attachment means (22, 24) are provided on the top end face of the bottom part (12) and the top part (14) for simultaneously securing the bottom part (12) against twisting after being screwed into the base member (10) and for preventing the top part (14) from twisting relative to the bottom part (12) by pressing the shoulder (15) against the top edge of the base member (10).

2. A single tooth implant according to claim 1, characterised in that the tool attachment device provided on the end face of the bottom part (12) has a diametrically extending web (22).

3. A single tooth implant according to claim 1 or 2, characterised in that the tool attachment means provided on the end face of the top part (14) has at least two diametrically opposite grooves (24).

4. A single tooth implant according to any of the preceding claims, characterised in that the inner bore of the bottom part (12) for receiving the post (16) is formed near its top edge with a centring thread (26) for attaching a tool.

5. A tool for use on an individual tooth implant according to any of the preceding claims, characterised by a bottom-part key (32) complementary with the tool attachment means (22) provided on the end face of the bottom part (12) and a top-part key (34) rotatable relative to the bottom-part key (32) and complementary



relative to the tool attachment means (24) provided on the end face of the top part (14).

6. A tool for use on an individual tooth implant according to claim 4, characterised by a centring screw (30) which extends concentrically through the bottom-part key (32) and the top-part key (34) for insertion in the centring thread (26) of the bottom part (12).

7. A tool according to claim 6, characterised in that the centring screw (30) can be actuated by means of a milled head (28).

8. A tool according to any of claims 5 to 7, characterised in that the bottom-part key (32) and the top-part key (34) have securing levers extending substantially at right angles to the axis of their relative rotation.