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Prosthesis or surgical instrument equipped with a fixing screw

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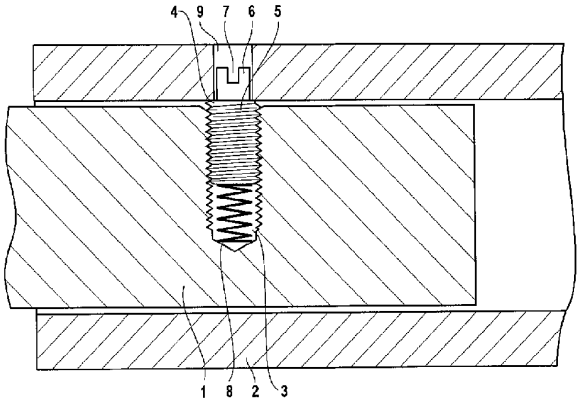
[Fortsetzung auf der nächsten Seite]

(54) Title: PROSTHESIS OR SURGICAL INSTRUMENT EQUIPPED WITH A FIXING SCREW

(54) Bezeichnung: CHIRURGISCHES IMPLANTAT ODER INSTRUMENT MIT SICHERUNGSSCHRAUBE



(57) Abstract: The invention concerns a prosthesis or a surgical instrument comprising two parts (1, 2) one sliding on the other, the lower part (1) being provided with a threaded bore (3) and the upper part (2) being provided with a passage orifice (9) for receiving a fixing screw (4). The invention is characterized in that a set screw (5) can be introduced over its entire length beneath the upper part (2) in the threaded bore (3), said screw including at its upper end a dog point, which is thinner than the threaded part (5) and which is provided with a groove for screwdriver (7). The diameter of the passage orifice (9) is smaller than that of the threaded part and larger than that of the dog point (6). In a preferred embodiment, an elastic device (8) pushes the fixing screw into fixing position.

[Fortsetzung auf der nächsten Seite]

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Erklärungen gemäß Regel 4.17:

— *hinsichtlich der Identität des Erfinders (Regel 4.17 Ziffer i) für die folgenden Bestimmungsstaaten AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI-Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *hinsichtlich der Berechtigung des Anmelders, ein Patent zu beantragen und zu erhalten (Regel 4.17 Ziffer ii) für die folgenden Bestimmungsstaaten AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), europäisches Patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI-Patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

— *Erfindererklärung (Regel 4.17 Ziffer iv) nur für US*

Veröffentlicht:

— *mit internationalem Recherchenbericht*

Zur Erklärung der Zweibuchstaben-Codes und der anderen Abkürzungen wird auf die Erklärungen ("Guidance Notes on Codes and Abbreviations") am Anfang jeder regulären Ausgabe der PCT-Gazette verwiesen.

(57) **Zusammenfassung:** Chirurgisches Implantat oder Instrument mit zwei übereinander verschiebbar geführten Teilen (1, 2), von denen der untere (1) eine Gewindebohrung (3) und der obere (2) eine Durch- gangsbohrung (9) zur Aufnahme einer Sicherungsschraube (4) enthalten. Erfindungsgemäss kann die kopflos ausgebildete Schraube (5) in voller Länge unterhalb des oberen Teils (2) in der Gewindebohrung (3) aufgenommen werden und weist sie am oberen Ende eine mit einer Schraubendrehervertiefung (7) versehenen Ansatz auf, der dünner ist als ihr Gewindeteil (5), wobei der Durchmesser der Durchgangsbohrung (9) geringer als der des Gewindeteils und grösser als der des Ansatzes (6) ist. Vorzugsweise ist eine elastische Einrichtung (8) vorgesehen, die die Sicherungsschraube in die Sicherungsstellung drängt.

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Surgical implant or instrument with fixing screw

The invention relates to a surgical implant or instrument with fixing screw.

In surgical implants or instruments, it is sometimes necessary for two mutually displaceably guided parts to be secured against displacement by means of a screw. It is known to do this by screwing a fixing screw through a passage orifice in the upper of the two parts until its head sits firmly on the top face of the upper of the two parts. This has the disadvantage that the screw can be lost, which can have serious consequences in the confined operating site.

It is known (EP-A-589325, EP-A-1031332) to avoid problem by using a screw which is designed as a set screw and can be accommodated over its entire length in the threaded bore (in any case beneath the lower face of the upper of the two parts). It has an upper, thinner dog point which contains a groove for a screwdriver. The diameter of the passage orifice is smaller than that of the screw thread but larger than that of the screw dog point. Before the parts are joined together, the screw is screwed into the threaded bore to such a depth that it disappears completely therein or at any rate lies so deep that the upper of the two parts can slide over it. The screwdriver is then engaged through the passage orifice of the upper part and is used to turn the screw upward until its dog point lies in the passage orifice. The two parts are now secured against relative displacement so long as the screw is turned tight. If the screw loosens, however, it may happen that it gradually drifts downward to such an extent that the fixing action is compromised.

Therefore the object of the invention is to ensure more substantial fixing against the fixing screw falling back

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into the threaded bore. According to the invention, this is achieved by the fact that it is acted upon from the lower end by an elastic force, for example a spring.

The terms "upward" and "downward" used in this text and in the claims are not to be interpreted in the sense of geodetic height, but instead signify the position relative to the observer seeking access to the fixing screw. The lower part is, generally speaking, the part covered by the upper part.

The invention is explained in greater detail below with reference to the drawing which depicts an advantageous illustrative embodiment in cross section.

A bolt 1 is to be connected to a sleeve 2 which, having a slightly greater diameter, is pushed over the bolt. Their interacting surfaces provide a guide which permits a relative movement between the two parts only parallel to their longitudinal axis.

The bolt 1 has a threaded bore 3 extending transversely with respect to its longitudinal axis. The threaded screw 4, which has a threaded portion 5 and an upper dog point 6, sits in said threaded bore 3, and the upper dog point 6 has a slit or hexagon socket 7 for connection to a screwdriver. The dog point 6 has a smaller diameter than the threaded portion 5. A

compression spring 8 is located between the bottom of the threaded bore 3 and the bottom of the screw 4. The threaded bore 3 has a length which, disregarding the length required for receiving the compressed spring 8, is greater than that of the screw 4. The passage orifice 9 in part 2 has a diameter which is smaller than that of the threaded portion 5 and larger than that of the dog point 6 of the screw 4.

Before assembly, the screw 4 is sunk fully into the threaded bore 3. It should at least not protrude from the threaded bore 3 any more than a distance corresponding to the play between the mutually facing surfaces of the parts 1 and 2. The parts 1 and 2 are then pushed together until the passage orifice 9 lies over the screw 4. A screwdriver is then used to unscrew the screw 4 until its dog point 6 lies inside the passage orifice 9. If so desired, it can be turned until the shoulder of its threaded portion 5 bears sufficiently tightly on the edge of the passage orifice 9.

The latter is not absolutely essential if the spring 8 is present. This is because the latter pushes the screw 4 upward, so that it cannot sink back into the threaded bore 3 under the effect of any forces that occur.

It will be appreciated that the spring 8 represented as helical spring can be replaced by other spring means, for example by a foam plug made of an elastic synthetic material.

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Patent Claims

1. A surgical implant or instrument with two parts, one sliding on the other, a lower part being provided with a threaded bore and an upper part being provided with a passage orifice for receiving a fixing screw which is designed as a set screw and can be received over its entire length beneath the upper part in the threaded bore and includes, at its upper end, a dog point which is thinner than its threaded part and which is provided with a groove for a screwdriver, the diameter of the passage orifice being smaller than that of the threaded part and larger than that of the dog point wherein an elastic device is provided for pushing the fixing screw into the fixing position.

2. The implant or instrument as claimed in claim 1, wherein the threaded bore is a blind bore.

3. The implant or instrument as claimed in claim 1 or 2, wherein the fixing screw and the threaded bore have interacting limit stops to secure against downward removal of the fixing screw from the threaded bore.

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