

(19) FRENCH REPUBLIC

**INSTITUT NATIONAL
DE LA PROPRIETE INDUSTRIELLE**

PARIS

(11) **Publication No.:** **2 861 576**
(To be used only for
reprographic orders)

(21) **National Registration
No.:** **03 12825**

(51) Int. Cl.⁷: **A 61 B 17/72**

(12) **PATENT APPLICATION** **A1**

(22) **Date of filing:** 31.10.03

(30) **Priority:**

(43) **Date of publication of the application:**
06.05.05 Bulletin 05/18

(56) **List of documents cited in the search
report:**

See the end of this fax

(60) **References of other relevant national
documents:**

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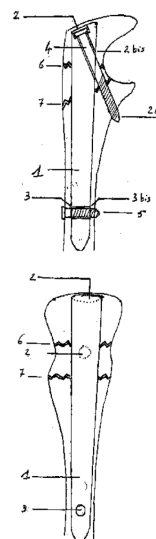
(74) **Representative(s):**

(54) **DEVICE FOR THE OSTEOSYNTHESIS OF FRACTURES OF THE PROXIMAL END OF THE
CUBITUS**

(57) The invention relates to a device allowing
osteosynthesis of fractures of the olecranon
such that rehabilitation can be undertaken
immediately post-op, and without the need for
further secondary intervention for the ablation
of the device, because this device is not
troublesome.

It consists of a nail (1) having a proximal orifice
or tunnel (2) and at least two distal orifices
facing one another or one distal tunnel (3) and
into which screws are introduced, one in a
proximal situation (4) and the other or others
(5) in a distal situation.

The device according to the invention is
particularly intended for osteosynthesis of
fractures of the olecranon.



FR 2 861 576 - A1

The present invention relates to a device for the osteosynthesis of fractures of the proximal end of the cubitus (olecranon).

5 The devices currently in existence mostly require ablation in the medium term because of the problems caused by the hardware (projecting beneath the skin). Such ablation is performed in the operating theatre under anesthetic, which involves a second intervention (with
10 the increase in morbidity that is inherent with any intervention) and a further hospitalization.

These are either devices made up of 2 pins which, inserted one on each side of the fracture site, stabilize same through the use of a steel wire wound in a figure of 8
15 around the pins (stays), or of screw-fastened plates, which are inconvenient because of their thickness beneath the skin, or of intramedullary nails that are unable to provide the fracture site with stability such that rehabilitation can be undertaken quickly.

20 The device according to the invention is able to overcome these disadvantages. It effectively, according to a first feature, comprises a nail through which there pass at least two screws allowing this nail to be anchored into
25 the bone. The nail may be solid or hollow. If the nail is solid, it has tunnels allowing the screws to pass through it. If the nail is hollow, it comprises orifices allowing the screws to pass through it. The upper end of this nail is chamfered and follows the natural curvature
30 of the bone at this point of the anatomy, thus avoiding it becoming exteriorized. The proximal diameter of the nail is greater than its distal-most diameter. There is an orifice or tunnel at the top of the nail which follows an oblique downward path toward the coronoid process.
35 This oblique downward path is intended to accept a screw passing from the proximal part toward the distal part to allow the nail to be anchored into the bone and compress the fracture site. This nail also has at least one orifice or one tunnel situated at the distal part of the nail,

running perpendicular to the axis thereof, and intended to accept a screw that allows the nail to be anchored into the bone, preventing it from mobilizing toward the proximal part of the olecranon and preventing the fracture site from twisting. The device as a whole thus allows early rehabilitation immediately post-op thanks to stable synthesis and hardware that is buried deep into the bone.

10 Depending on the anatomical variations of the patients being operated on and the particulars of embodiment:

The diameter and the length of the nail may vary

The nail may be solid or hollow

The diameter and the length of the screws may vary

15 The material used for manufacturing the nail or the screws may vary

The angle of the proximal tunnel relative to the axis of the nail may vary

The number and position of the distal tunnels may vary.

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The attached drawings illustrate the invention:

Figure 1 depicts the device of the invention in sagittal section

Figure 2 depicts the device of the invention in frontal section

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With reference to these drawings, the device comprises a nail (1) which may be solid or hollow. If the nail is hollow, it comprises at least 4 orifices; one orifice at the top (2), another in the midpart (2bis) and at least two others in its distal part (3 and 3bis). If the nail is solid, it comprises at least two tunnels; one tunnel starting from the top of the nail and leading in a direction that is oblique relative to the axis of the nail (2), and at least one tunnel situated in the distal part of the nail and perpendicular to the axis thereof (3). These tunnels are each intended to accept a screw so that they can be anchored into the bone. The screw

that passes through the proximal tunnel (4) allows the fracture site (6 and 7) to be compressed. The screw or screws in the distal situation (5) block rotation and prevent the nail from rising.

5

The proximal part of the nail which, at its top, has an orifice (2), is of diameter greater than the diameter of the distal part thereof. This difference in diameter provides the nail with better stability in the proximal part of the cubitus, which is wider at the olecranon. This proximal part of the nail adopts a chamfered shape so that it suits the anatomy of the olecranon.

The proximal screw (4) has a screw thread on the distal part thereof only. This screw thread is intended to hold it in the bone. The proximal and distal part of this screw is plain and has no screw thread; this is the part in contact with the nail. The top of the screw has a head, of a diameter wider than the diameter of the body of the screw and than the tunnel (2) through which the screw passes, thereby making it possible to halt the progress of the screw in its tunnel and obtain a compression effect at the fracture site.

The distal screw or screws (5) has or have a continuous screw thread so that the screw will hold in the two cortexes of the bone. This or these screws also have a head of a diameter greater than the diameter of the body of the screw(s) and of the tunnel (3) through which this (or these) screw or screws pass.

The abovementioned osteosynthesis device is associated with an ancillary intended to facilitate the fitting of said hardware and notably perform the screw placement using automatic sighting.

35

The device according to the invention is particularly intended for the treatment of fractures of the olecranon.

Claims

1. A device for the osteosynthesis of fractures of the upper end of the ulna (olecranon), characterized in that it consists of a nail (1) provided at its upper part with a means allowing the positioning of an upper fixation screw (4) in an oblique position relative to the axis of the nail (1) and at its lower part with at least one means (3) allowing one or more fixation screws (5) to be positioned in a position that is perpendicular to the axis of the nail (1).
2. The device as claimed in claim 1, characterized in that the nail (1) is solid.
3. The device as claimed in claim 1, characterized in that the nail (2) is hollow.
4. The device as claimed in claims 1 and 2, characterized in that the means allowing the upper fixation screw (4) to be positioned in an oblique position consists of a tunnel allowing the screw (4) to enter the nail (1).
5. The device as claimed in claims 1 and 3, characterized in that the means allowing the upper fixation screw (4) to be positioned in an oblique position consists of two orifices (2, 2bis) allowing the screw (4) to enter the nail (1), one of these (2) being at the top of the nail and the second one (2bis) being situated in the midpart of the nail (1).
6. The device as claimed in claims 1, 2 and 4, characterized in that the means allowing the lower fixation screw or screws (5) to be positioned in a position perpendicular to the axis of the nail (1)

comprises at least one tunnel (3) allowing the screw (5) to enter the nail (1).

- 5 7. The device as claimed in claims 1, 3 and 5, characterized in that the means allowing the lower fixation screw or screws (5) to be positioned in a position perpendicular to the axis of the nail (1) comprises at least two orifices (3bis) facing one another to allow at least one screw (5) to enter the nail (1).
- 10
8. The device as claimed in claim 1, characterized in that it comprises a proximal part with a greater diameter than its distal end.
- 15
9. The device as claimed in claim 1, characterized in that its proximal end is chamfered to suit the anatomy of the olecranon.

Single Sheet

Figure 1

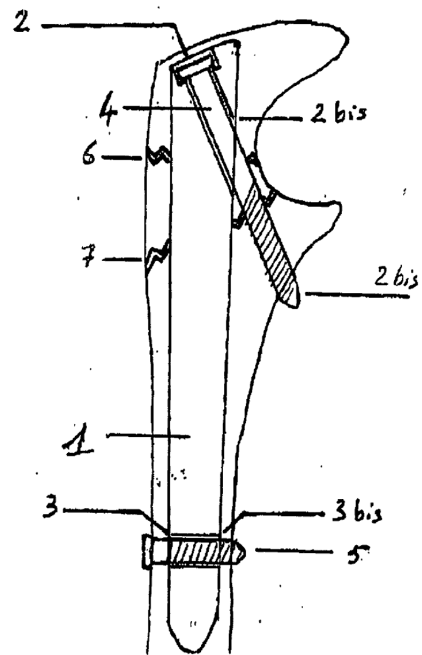
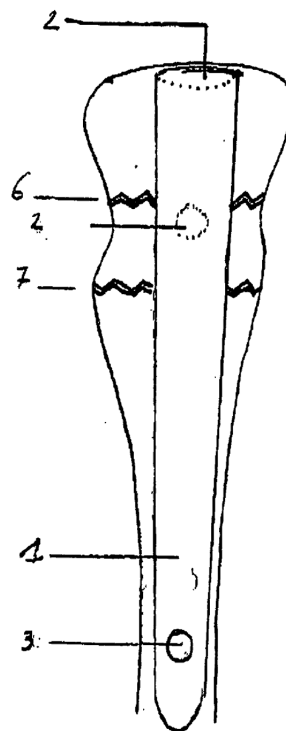


Figure 2



FRENCH REPUBLIC



PRELIMINARY SEARCH REPORT

drawn up on the basis of the last claims filed before the
search was started

National application No.

FA 644598

FR 0312825

DOCUMENTS CONSIDERED TO BE RELEVANT		Relevant to claim	Classification assigned to the invention by the INPI
Category	Citation of the document with indication, where appropriate, of relevant passages		
X	EP 1 095 626 A (SULZER ORTHOPEDICS LTD) 2 May 2001 (2001-05-02) * column 3, line 4 - line 35; figures 1,2 *	1,2,4-9	A61B17/72
X	WO 99/35989 A (HABERNEK HANS; HERZA CLAUS (AT)) 22 July 1999 (1999-07-22) * abstract *	1-9	
X	US 4 622 959 A (MARCUS RANDALL E) 18 November 1986 (1986-11-18) * figure 1 *	1-9	
			TECHNICAL FIELDS SEARCHED (Int.Cl. ⁷)
			A61B
Date of completion of the search		Examiner	
22 June 2004		Ducreau, F	
CATEGORY OF CITED DOCUMENTS X: particularly relevant if taken alone Y: particularly relevant if combined with another document of the same category A: technological background O: non-written disclosure P: intermediate document T: theory or principle underlying the invention E: document of prior patent, but published on the filing date or after that date D: cited in the application L: cited for other reasons &: member of the same patent family, corresponding document			

ANNEX TO THE PRELIMINARY SEARCH REPORT
ON FRENCH PATENT APPLICATION NO. FR 0312825 FA 644598

This annex lists the patent family members relating to the patent documents cited in the above-mentioned search report.

The members are as contained in the European Patent Office EDP file on 22-06-2004

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