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Patents Act 1990

**NOTICE OF ENTITLEMENT**

I/We Dietmar PENNIG

of HANS-DRIESCH-STR. 12  
50935 KOLN  
GERMANY

being the applicant(s) and nominated person(s) in respect of an application for a patent for an invention entitled SCREW FOR SECURING AN INTRAMEDULLARY PIN (Application No. 73460/94), state the following:

1. The nominated person(s) has/have, for the following reasons, gained entitlement from the actual inventor(s):

THE NOMINATED PERSON IS THE ACTUAL  
INVENTOR.

2. The nominated person(s) has/have, for the following reasons, gained entitlement from the applicant(s) listed in the declaration under Article 8 of the PCT:

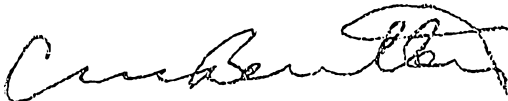
THE APPLICANT AND NOMINATED PERSON IS THE  
BASIC APPLICANT.

3. The basic application(s) listed in the declaration under Article 8 of the PCT is/are the first application(s) made in a Convention country in respect of the invention.

DATED: 18 October 1994

Dietmar PENNIG

GRIFFITH HACK & CO



Patent Attorney for and  
on behalf of the applicant

PAPCB13B 1.9

PCT APPLICATION DETAILS

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Application ID: 73460 / 94 PCT Number : PCT/DE94/00228

Applicant-Name

Dietmar Pennig

Hans Driesch Strasse 12

D-50935 Koln

Germany

Title : Screw for securing an intramedullary nail

Priority Country Priority Date Priority App. No.

DE 11 MAR 93 4307633

Address-for Service :

GRIFFITH HACK & CO

GPO Box 1285K

MELBOURNE VIC 3001

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**(12) PATENT ABRIDGMENT (11) Document No. AU-B-73460/94**  
**(19) AUSTRALIAN PATENT OFFICE (10) Acceptance No. 668657**

- (54) Title  
**SCREW FOR SECURING AN INTRAMEDULLARY NAIL**
- International Patent Classification(s)  
(51)<sup>s</sup> **A61B 017/58**
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- (87) PCT Publication Number : **WO94/20039**
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- (71) Applicant(s)  
**DIETMAR PENNIG**
- (72) Inventor(s)  
**DIETMAR PENNIG**
- (74) Attorney or Agent  
**GRIFFITH HACK & CO , GPO Box 1285K, MELBOURNE VIC 3001**
- (56) Prior Art Documents  
**DE 2246274**  
**AU 33298/78**
- (57) Claim

1. Screw (1) for securing an intramedullary pin, with a screw head (2) and a screw shaft (3) with an external thread (4), characterized by the fact that
  - a) the screw shaft thread (4) is provided close to the screw head (2) on only a part of the length of the screw shaft (3),
  - b) the screw head (2) is in the form of a hexagon socket head or Phillips head, and
  - c) the screw head (2) has on its outer side an external thread (5), the direction of which is opposite to the direction of the screw shaft thread (4).

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<p>(51) Internationale Patentklassifikation<sup>5</sup>: <b>A61B 17/58</b></p>	<p><b>A1</b></p>	<p>(11) Internationale Veröffentlichungsnummer: <b>WO 94/20039</b> (43) Internationales Veröffentlichungsdatum: 15. September 1994 (15.09.94)</p>
<p>(21) Internationales Aktenzeichen: PCT/DE94/00228 (22) Internationales Anmeldedatum: 1. März 1994 (01.03.94) (30) Prioritätsdaten: P 43 07 633.5 11. März 1993 (11.03.93) DE (71)(72) Anmelder und Erfinder: PENNIG, Dietmar [DE/DE]; Hans-Driesch-Strasse 12, D-50935 Köln (DE). (74) Anwalt: HABEL &amp; HABEL; Am Kanonengraben 11, D-48151 Münster (DE).</p>	<p>(81) Bestimmungsstaaten: AU, CN, JP, KR, NO, europäisches Patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). <b>Veröffentlicht</b> <i>Mit internationalem Recherchenbericht.</i></p> <p style="font-size: 2em; text-align: center;">668657</p>	

(54) Title: SCREW FOR SECURING AN INTRAMEDULLARY NAIL

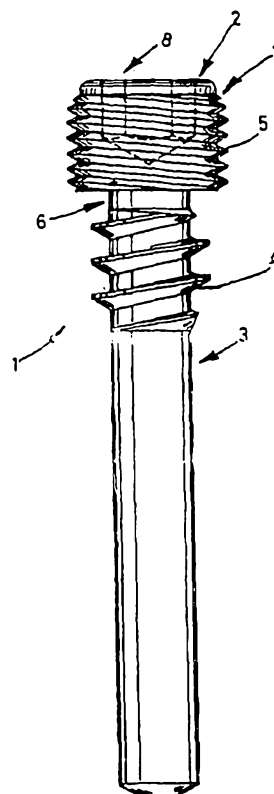
(54) Bezeichnung: SCHRAUBE ZUM FESTLEGEN EINES MARKKRAUMNAGELS

(57) Abstract

The invention relates to a screw for securing an intramedullary nail in which the male thread extends only over part of the length of the shank and the screw head has a male thread of opposite pitch to that of the shank.

(57) Zusammenfassung

Die Erfindung betrifft eine Schraube zum Festlegen eines Marknagels, wobei das Außengewinde auf dem Schraubenschaft nur auf einem Teil der Schaftlänge vorgesehen ist und der Schraubenkopf mit einem Außengewinde ausgerüstet ist, dessen Steigung entgegengesetzt der Steigung des Schraubenschaftgewindes ausgerichtet ist.



Screw for securing an intramedullary pin

The invention relates to a screw for securing an intramedullary pin in accordance with the preamble of the main claim.

The securing of intramedullary pins by means of screws is known, for example, from EP 306 709 A2. Here screws are used which have an external thread over their entire shaft length and thus pass through the medullary pin.

Screws with an external thread only over part of their length are known from US 44 63 753, the two threaded regions of this screw serving to create a compression screw which draws together the two parts of the bone separated by a fracture. The direction of the thread in the two threaded regions separated from each other is in this case the same and this screw is not used in association with an intramedullary pin.

In contrast to this, the invention is based on the problem of providing a screw for securing an intramedullary pin which is intended to secure the intramedullary pin in the simplest manner and is intended to be easily removable.

This problem on which the invention is based is solved by the principle of the main claim.

Convenient embodiments are explained in the subsidiary claims.

In other words, a screw is proposed which has an external thread on only a part of the screw shaft, the region without a thread being intended to pass through the intramedullary pin, while the region with the thread secures the screw in the cortex of the bone.

The head of the screw is in the form of a hexagon socket screw head, or Phillips head, so that by inserting an appropriate screwdriver it is possible to insert the screw into the bone and to introduce the part of the screw shaft without a thread into the medullary pin.



In the screw in accordance with the invention an external thread is provided on the outer side of the screw head, the direction of this thread, however, being opposite to the direction of the thread on the screw shaft. Through this it is possible, for the removal of the screw, to apply to the outer side of the screw head a screwdriver provided with an internal thread, through the turning of which, which is opposite to the direction of turning used on inserting the screw, the screw can now be removed from the bone.

This direction of turning might also be produced by the socket-head screwdriver, but in the case of such a socket-head screwdriver no tension can be applied to the screw, so that the removal of the grown-in screw from the bone is virtually impossible.

The external thread of the screw head does not begin on the upper side of the screw head, but slightly to the rear of this, so that a cylindrical projection is produced in the region of the screw head which facilitates the application of the screwdriver with an internal thread.

Between the lower side of the screw head and the external thread of the screw shaft there is a space, the size of which is determined by the size of the screw and the purpose for which the screw is used.

An embodiment of the invention is explained below by means of the drawings.

The drawings show in

figure 1 a new screw, and in  
figure 2 a screw with two screwdrivers.

In the drawings a screw 1 is shown which has a head 2 and a shaft 3. The greatest part of the screw shaft is without a thread, and only in the vicinity of the lower side of the screw head 2 is a screw shaft thread provided. When the screw 1 is used to secure the intramedullary pin, this threaded shaft 4 is screwed into the cortex of the bone.



The screw head 2 is in the form of a hexagon socket head 8, but may also be provided with a crossed slot, so that screwing in is possible by using an appropriate screwdriver 9.

A screw head thread 5, the direction of which is opposite to that of the screw shaft thread 4, is provided on the outer side of the screw head, so that on turning with a screwdriver 10 equipped with an appropriate internal thread and after applying a shoulder 11 on the screw head 2 a reversal of the screw 1 out of the patient's bone is now possible. Here an appropriate tension can be applied at the same time to the screw 1, so that a satisfactory removal of the screw 1 from the bone becomes possible.

As the drawing shows, a cylindrical region 7, without thread, is provided between the upper edge of the screw head thread 5 and the upper side of the screw head 2, this making possible easy application of the screwdriver 10 to the screw head thread 5, even when the screw head is located inside the patient, i.e. is not visible.

Between the lower side of the screw head 2 and the screw head thread 4 there is a region 6 without a thread, the size of this being determined by the size of the screw 1 and the purpose for which it is to be used.



C l a i m s

1. Screw (1) for securing an intramedullary pin, with a screw head (2) and a screw shaft (3) with an external thread (4), characterized by the fact that
  - a) the screw shaft thread (4) is provided close to the screw head (2) on only a part of the length of the screw shaft (3),
  - b) the screw head (2) is in the form of a hexagon socket head or Phillips head, and
  - c) the screw head (2) has on its outer side an external thread (5), the direction of which is opposite to the direction of the screw shaft thread (4).
2. Screw in accordance with claim 1, characterized by the fact that the screw head thread (5) starts at a distance from the free end of the screw head (2) and the outside diameter of the screw head (2) here corresponds approximately to the core diameter of the screw head thread (5).
3. Screw in accordance with claim 1 or 2, characterized by the fact that a region (6) without a thread is provided between the screw shaft thread (4) and the lower side of the screw head (2).
4. Screw in accordance with any one of the foregoing claims, characterized by the fact that the depth of the screw shaft thread (4) decreases towards the unthreaded screw shaft (3).



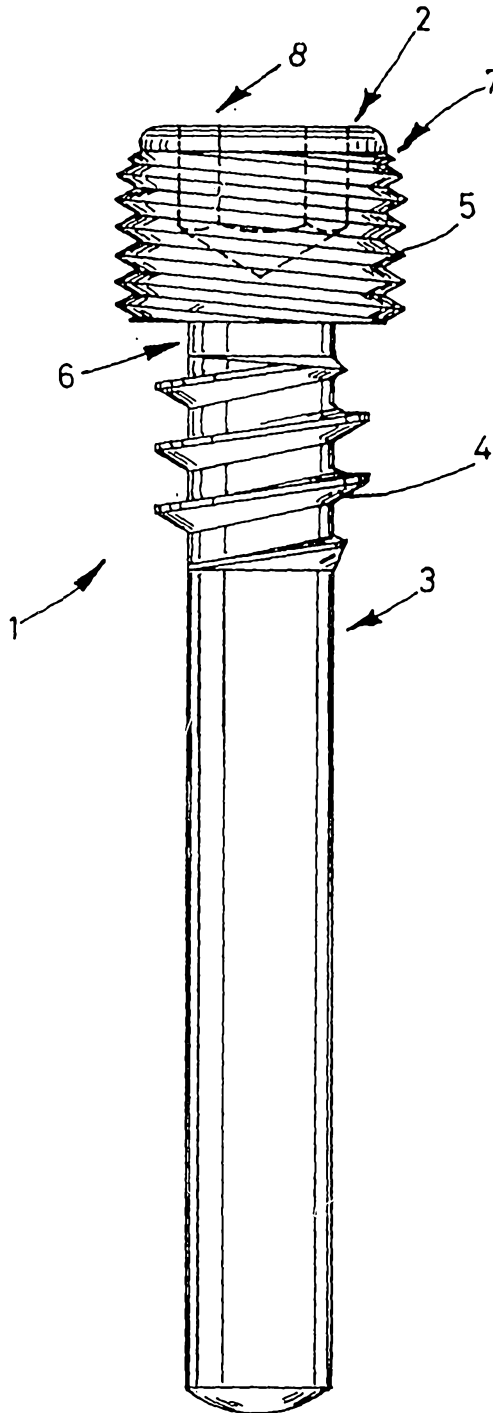


A b s t r a c t

The invention relates to a screw for securing a medullary pin, the external thread on the screw shaft being provided on only a part of the shaft length and the screw head being provided with an external thread, the pitch of which is opposite to the pitch of the screw shaft thread.



FIG. 1



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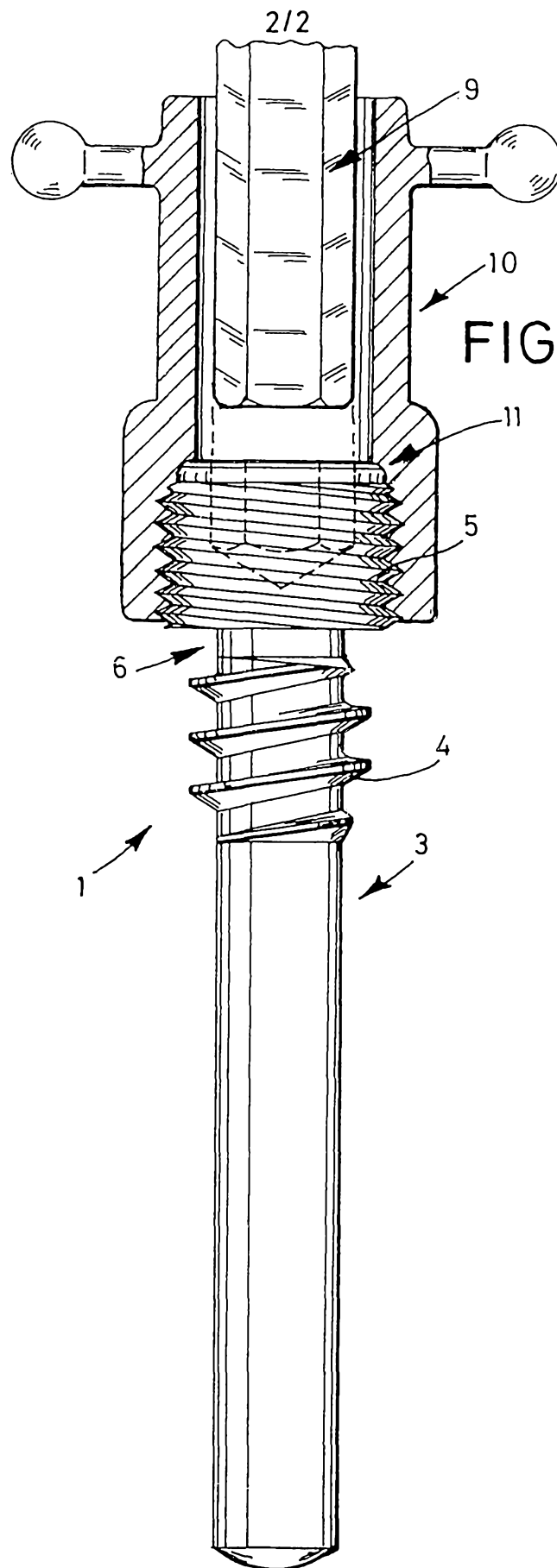


FIG. 2

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/DE 94/00228

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 5 A61B17/58

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)

IPC 5 A61B

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 practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DE,A,22 46 274 (ORTOPEDICA GMBH) 28 March 1974 see page 4, last paragraph; figure 2 ---	1
A	US,A,5 116 337 (L. L. JOHNSON) 26 May 1992 see column 3, line 20 - line 31 ---	1
A	US,A,4 723 541 (H. W. REESE) 9 February 1988 see column 2, line 39 - line 44; figure 1 -----	1

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

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- \*&\* document member of the same patent family

Date of the actual completion of the international search

25 May 1994

Date of mailing of the international search report

08.06.94

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tlx. 31 651 epo nl,  
Fax (+31-70) 340-3016

Authorized officer

Gérard, B

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.  
PCT/DE 94/00228

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
DE-A-2246274	28-03-74	NONE	
US-A-5116337	26-05-92	NONE	
US-A-4723541	09-02-88	NONE	

# INTERNATIONALER RECHERCHENBERICHT

Internationales Aktenzeichen

PCT/DE 94/00228

A. KLASSIFIZIERUNG DES ANMELDUNGS- GEGENSTANDES  
IPK 5 A61B17/58

Nach der Internationalen Patentklassifikation (IPK) oder nach der nationalen Klassifikation und der IPK

B. RECHERCHIERTE GEBIETE

Recherchierter Mindestprüfstoff (Klassifikationssystem und Klassifikations-symbole )  
IPK 5 A61B

Recherchierte aber nicht zum Mindestprüfstoff gehörende Veröffentlichungen, soweit diese unter die recherchierten Gebiete fallen

Während der internationalen Recherche konsultierte elektronische Datenbank (Name der Datenbank und evtl. verwendete Suchbegriffe)

C. ALS WESENTLICH ANGESEHENE UNTERLAGEN

Kategorie*	Bezeichnung der Veröffentlichung, soweit erforderlich unter Angabe der in Betracht kommenden Teile	Betr. Anspruch Nr.
A	DE,A,22 46 274 (ORTOPEDICA GMBH) 28. März 1974 siehe Seite 4, letzter Absatz; Abbildung 2 ---	1
A	US,A,5 116 337 (L. L. JOHNSON) 26. Mai 1992 siehe Spalte 3, Zeile 20 - Zeile 31 ----	1
A	US,A,4 723 541 (H. W. REESE) 9. Februar 1988 siehe Spalte 2, Zeile 39 - Zeile 44; Abbildung 1 -----	1

Weitere Veröffentlichungen sind der Fortsetzung von Feld C zu entnehmen

Siehe Anhang Patentfamilie

\* Besondere Kategorien von angegebenen Veröffentlichungen :

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Datum des Abschlusses der internationalen Recherche

25. Mai 1994

Absendedatum des internationalen Recherchenberichts

08.06.94

Name und Postanschrift der Internationale Recherchenbehörde

Europäisches Patentamt, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+ 31-70) 340-2040, Tx. 31 651 epo nl,  
Fax (+ 31-70) 340-3016

Bevollmächtigter Bediensteter

Gérard, B

# INTERNATIONALER RECHERCHENBERICHT

Angaben zu Veröffentlichungen, die zur selben Patentfamilie gehören

Internationales Aktenzeichen

PCT/DE 94/00228

Im Recherchenbericht angeführtes Patentdokument	Datum der Veröffentlichung	Mitglied(er) der Patentfamilie	Datum der Veröffentlichung
DE-A-2246274	28-03-74	KEINE	
US-A-5116337	26-05-92	KEINE	
US-A-4723541	09-02-88	KEINE	