Industria y Comercio

SUPERINTENDENCIA

PCT

SOLICITUD

PATENTE DE INVENCIÓN

21. EXPEDIENTE Nº 03-96821

54. TÍTULO DISPOSITIVO OSTEOSINTETICO

51. CLASIFICACIÓN INTERNACIONAL A61B 17/72

71. SOLICITANTE SYNTHES AG CHUR

DOMICILIO Chur, Suiza.

74. APODERADO EMILIO FERRERO

Código: 1092

22. BOGOTÁ, D. C.

(FORMA P 10)

Industria y Comercio
SUPERINTENDENCIA

PETITORIO

SUPERINTENDENCIA DE COMERCIO
Radicacion : 03096821 00000000 Folios: 69
Fecha (MM): 2003-10-30 17:32:39 ación
Tramite : 011 PCT-PATENT 379 FASE NACI 411 PRESENTAC
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

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FORMULARIO UNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL

1 **SOLICITUD DE:**

☒ Patente de Invención. ☐ Patente de Modelo de Utilidad.

☐ Capítulo I. ☒ Capítulo II.

2 **SOLICITANTE (71)**

Nombre: **SYNTHES AG CHUR** sociedad constituida y existente bajo las leyes de Suiza.

Dirección: Grabenstrasse 15, CH-7002 Chur, Suiza.

Domicilio: Chur, Suiza.

IDENTIFICACION

C.C. ☐ NIT ☐

C.E. ☐ Otro ☐ Cual_____

Número: _____

3 **REPRESENTANTE O APODERADO**

Nombre: EMILIO FERRERO

Dirección: Carrera 4ª. No. 72-35
Teléfono: 347 36 11
Fax:: 217 92 11
E-mail: clientes@camvp.com.
Domicilio: Bogotá, Colombia.

IDENTIFICACION

C.C. ☒ NIT ☐

C.E. ☐ Otro ☐ Cual_____

Número: 438.019 T.P. 31.929

4 **INVENTOR (ES) (72)**

1- **Markus HEHLI**
Junkerboden,
CH-7276 Davos Frauenkirch,
Suiza.

2- **Alberto FERNÁNDEZ DELL'OCA**
Av. Italia 2420,
11600 Montevideo,
Uruguay

5 **PCT (86)**

Solicitud Internacional No. PCT/CH01/00276 Fecha: 3 de mayo de 2001

Publicación Internacional No. WO 02/089683 A1 Fecha : 14 de noviembre de 2002

6 **Título (54)** DISPOSITIVO OSTEOSINTETICO

7 **Clasificación Internacional (51)** A61B 17/72

8 **Prioridad**

SI ☐ NO ☒

(33) País de Origen	(32) Fecha	(31) Número de Solicitud

9 **Comprobante de pago No:** 03-75.150 **Fecha:** 15 de octubre de 2002

10

Anexos:

- [x] Comprobante de pago de la tasa de presentación de la solicitud por $ 400.000.oo.
- [ ] Comprobante de pago por reivindicación de prioridad.
- [x] Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- [x] Poderes, si fuere el caso.
- [ ] Documento de cesión del inventor al solicitante o a su causante.
- [ ] Declaraciones.
- [x] Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- [x] Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- [x] Copia del examen preliminar efectuado por la IPEA.
- [x] Traducción del examen preliminar efectuado por la IPEA.
- [ ] De ser el caso, copia del contrato de acceso.
- [ ] De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas.
- [ ] De ser el caso, certificado de depósito del material biológico.
- [x] Arte final 12x12
- [ ] De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud.
- [ ] Otros

11

FIGURA CARACTERISTICA:

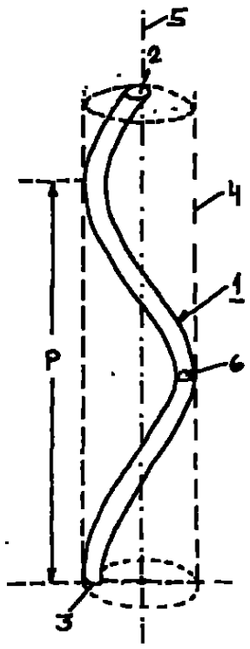


Fig. 1

12 Solicito la concesión de la patente,

NOMBRE: EMILIO FERRERO

FIRMA :

C.C. 438.019 de Usaquén T.P. 31.929

MRE/85

M-210/CO

801304-8
005-5

CAVELIER
ABOGADOS
EDIFICIO SURKI
CARRERA 4ª Nº 72-35
BOGOTA, 8 - COLOMBIA

For patents, utility designs, trademarks, service marks, commercial names, insignia.

Para patentes, modelos y dibujos industriales, marcas de fábrica y de servicio, nombres comerciales y enseñas.

REPRESENTACION Y PODER

REPRESENTATION AND POWER OF ATTORNEY

I (we), the undersigned / Yo (nosotros), abajo firmado(s)
Synthes AG Chur
of / domiciliado(a) en Grabenstrasse 15
CH-7002 Chur

por el presente nombramos a GERMAN CAVELIER, tpa. 832; GONZALO PERDOMO, tpa. 831; ERNESTO CAVELIER, tpa. 11519; y EMILIO FERRERO, tpa. 31929; domiciliados en la Carrera 4ª Nº 72-35, Bogotá, Colombia, en obedecimiento a lo dispuesto en el parágrafo 1º del Artículo 543 del Código de Comercio, al primero como principal y los demás como suplentes, en su orden, como nuestros representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplente, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.
Además, y bajo las mismas reglas, conferimos poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal; a cuyo efecto autorizo(amos) a los dichos apoderados para que me(nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos y dibujos industriales; el registro de marcas de fábrica, colectivas, defensivas y de servicios; el depósito de nombres comerciales y enseñas; su renovación, traspaso, cambio de nombre o domicilio, cancelación voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de oposición, cancelación, nulidad, medidas cautelares, concesión de licencias y en general los juicios civiles, penales, administrativos o contencioso-administrativos relacionados con estos derechos; acciones y juicios que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, desistir, cancelar, recibir, renunciar, y ratificar los actos hechos por agentes oficiosos.

in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint GERMAN CAVELIER, tpa. 832; GONZALO PERDOMO, tpa. 831; ERNESTO CAVELIER, tpa. 11519; and EMILIO FERRERO, tpa. 31929; domiciled at Carrera 4ª Nº 72-35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate depending on case, and the mere fact or its exercise will suffice. The exercise of the representation by the first, second or third alternates in their turn shall end at such time.
In addition, we grant a Power of Attorney in favor of the above-named attorneys-at-law so that they may obtain the protection of my (our) industrial property and against the unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative contentious and judicial, in all matters concerning the following: a) Obtainment of patents, models and designs; the registration of trademarks, collective, defensive and service marks; the deposit of commercial names and insignia; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of opposition, cancellation, nullity, infringement, granting of licenses, and in general the civil, penal, and administrative suits relating to those rights; actions and suits instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, desist, cancel, receive, renounce and ratify acts done by representatives without a power of attorney.

Given and signed this / Dado y firmado hoy
July 21 1998
in / en Rep. Switzerland

Firma
SYNTHES AG CHUR
Grabenstrasse 15
CH - 7002 CHUR
Signature

TRADUCCION No.:
M[illegible] VIVIA MARTELO
Traductora e Intérprete Oficial
Inglés - Español - Inglés
Res. No. 2879 Min. Justicia

LEGALIZACION

El Señor Cónsul de Colombia debe expedir un *certificado consular* sobre (1) la existencia legal de la compañía que otorga el poder, (2) que ésta ejerce su objeto social, y (3) que las personas que otorgan el poder están autorizadas para darlo. A este efecto les solicitamos que muestren al Señor Cónsul las pruebas que acreditan esos hechos (1), (2) y (3).

LEGALIZATION

The Colombian Consul must issue a *cosular certificate*, on (1) the legal existence of the company which grants the Power-of-Attorney, (2) that it is in actual exercise of its company purposes, and (3) that the persons who execute the Power of Attorney are authorized to do so. To this effect, please show the Consul the evidence to prove the above facts (1), (2) and (3).

Eva Bertossa-Bertschi, notary public of the Canton of Berne (Switzerland), with office at Berne, Zeughausgasse 29

certifies:

The foregoing signature "pp. M. Jacques" on behalf of Synthes AG Chur, with registred office in Chur (Switzerland), was written by Mrs Margrit Jaques-Baumann, born on 5th March 1947 of Sainte-Croix and Flawil (Switzerland), director, divorced, Blockweg 8, 3007 Berne, who has single signature on behalf of Synthes AG Chur and is known to the notary personally.

Certified at the office of the notary public on the twenty-third of July ninteenhundert and ninety eight.

23rd July 1998

Reg. B. No 994

The notary public:

E. [illegible]

CANTÓN DE BERNA * CANCILLERÍA DE ESTADO *

Tasa: CHF 15.–

Visto para la legalización de la firma que precede de

Eva Bertossa-Bertschi

notario del cantón de Berna

Número: 2093 **Cancillería de Estado del cantón de Berna**

23/7/98 Carmen Isella

NOTA PARA EL SEÑOR CONSUL DE COLOMBIA: Según los artículos 65 del C. de P. C. y 840 del C. de Co., si el poderdante es una sociedad, el Señor Cónsul debe certificar que tuvo a la vista las pruebas de su existencia, que ejerce su objeto social y que quien confiere el poder es su representante.

Consulado de Colombia

Berna

TRADUCCION No.:
MARIA ELVIRA MARTELO
Traductora e Interprete Oficial
Inglés - Español - Inglés
Res. No. 2879 Min. Justicia

AUTENTICACION DE FIRMA No. 1405

BERNA, 11 DE AGOSTO DE 1.998

EL SUSCRITO SEGUNDO SECRETARIO ENCARGADO DE LAS FUNCIONES CONSULARES DE LA EMBAJADA DE LA REPÚBLICA DE COLOMBIA

CERTIFICA :

Que la señora **CARMEN ISELI** que autoriza el presente documento, ejercía legalmente en la fecha expresada, las funciones de Oficial del Oficial de la Cancillería de Estado del Cantón de Berna y que la firma y sello que en el documento aparecen como suyos, son los que usa y acostumbra en sus actos oficiales, de acuerdo con el registro que se lleva en este Consulado.

El Suscrito Segundo Secretario Encargado de las Funciones Consulares de la Embajada, no asume responsabilidad alguna por el contenido del documento autenticado.

COTEJADA CON EL ORIGINAL QUE APARECE EN EL DOCUMENTO PRESENTADO
LAS FIRMAS QUE APARECEN EN EL

COMO NOTARIO SEXTO (E) DEL CIRCULO DE BOGOTA, D.C. CERTIFICA QUE LA FOTOCOPIA COINCIDE CON EL DOCUMENTO QUE HE TENIDO A LA VISTA

28 OCT 2003

PABLO BENJUMEA BARRAGAN
NOTARIO (E)

Rafael Antonio Torres Martín

MINISTERIO DE RELACIONES EXTERIORES
17889

98 AUG 24 AM 11:51
JUEZ DE LEGALIZACIONES
SANTAFE DE BOGOTA D.C.

NO SE ASUME RESPONSABILIDAD DEBIDO

Pagado Impuesto de Timbre: U$ 6.00

- Pagado Derechos Consulares: U$ 15.00

COMO NOTARIO SEXTO (E) DEL CIRCULO DE BOGOTA, HAGO CONSTAR QUE LA FOTOCOPIA CORRESPONDE CON EL ORIGINAL QUE HE TENIDO A LA VISTA

28 OCT 2003

PABLO MENDEZ BARAJAS
NOTARIO (E)

Consulado de Colombia

Berna

TRADUCCION No.:
MARIA ELVIRA MARTELO
Traductora e Interprete Oficial
Inglés - Español - Inglés
Res. No. 2879 Min. Justicia

CERTIFICACIÓN NO.000388

EL SUSCRITO SEGUNDO SECRETARIO ENCARGADO DE LAS FUNCIONES CONSULARES DE LA EMBAJADA DE LA REPUBLICA DE COLOMBIA

C E R T I F I C A

Que la compañía **SYNTHES AG CHUR** domiciliada en Grabenstr. 15, Chur/Suiza, existe y esta organizada de conformidad con las leyes de Suiza y que esta cumple con su objeto legal.

Que la señora **MARGRIT JAQUES-BAUMANN** desempeña el cargo de representante de la sociedad y tiene facultad suficiente para otorgar poderes y nombrar apoderados en el exterior.

Que todos los hechos anteriores constan por haber tenido a la vista los documentos respectivos (Certificado de Registro de la Cámara de Comercio de Friburgo expedido el 05 de agosto de 1998).

El Suscrito Segundo Secretario Encargado de las Funciones Consulares no asume responsabilidad por el contenido del documento.

Dado y firmado en Berna, a los once (11) días del mes de agosto de novecientos noventa y ocho (1998).

Rafael Antonio Torres Martín

- Pagado impuesto de timbre: us$ 6.00.
- Pagado derechos consulares: us$ 100.00

MINISTERIO DE RELACIONES EXTERIORES
17890
CONSULADO FIRMA APARECE EN EL DOCUMENTO DESEMPEÑA LAS FUNCIONES INDICADAS
NO SE ASUME RESPONSABILIDAD DEL TEXTO
LEGALIZACIONES DE BOGOTA D.C.
28 OCT 2005
98 AUG

TRADUCCION FICIAL No. 16.08/98 preparada por María Elvira Martelo, Traductora Oficial debidamente aprobada por el Ministerio de Justicia de Colombia por Resolución 2879 de 1995 y reconocida por el Ministerio de Relaciones Exteriores.

(A continuación se traducen los sellos y legalizaciones de un documento escrito en inglés y español, por el cual **SYNTHES AG CHUR** otorga poder a **GERMAN CAVELIER, GONZALO PERDOMO, ERNESTO CAVELIER Y EMILIO FERRERO**). Dado y firmado en Berna, Suiza, el 21 de julio de 1998. (Firma) ppa. M. Jacques SYNTHES AG CHUR, Grabenstrasse 15, CH - 7002 CHUR.

Eva Bertossa-Bertschi, notario público del Cantón de Berna (Suiza), con oficina en Berna, Zeughausgasse 29, certifica: la firma que antecede "ppa M. Jacques" a nombre de Synthes AG Chur, con oficina registrada en Chur (Suiza), fue impuesta por la Sra. Margrit Jaques-Baumann, nacida el 5 de marzo de 1940, de Sainte-Croix y Flawil (Suiza), directora, divorciada, Blockweg 8, 3007 Berna, quien tiene firma única a nombre de Synthes AG Chur y es conocida personalmente por el notario público.

Certificada en la oficina del notario público en tres de julio de mil novecientos noventa y ocho.

23 de julio de 1998, Reg. B. No. 994 El notario público. (Firma ilegible). (Sello notarial en tinta de Eva Bertossa-Bertschi).

(En español) Legalización de la firma que antecede expedida la Cancillería de Estado del Cantón de Berna el 28 de julio de 1998 bajo el No. 2093, firmado por Carmen Iseli. Pagada tasa por CHF15.

(En español) Certificación de la firma que antecede expedida por el Consulado de Colombia en Berna el 11 de agosto de 1998, bajo el No. 1405. Firma RAFAEL ANTONIO TORRES MARTIN. Pagado impuesto de timbre y derechos consulares.

Legalización de la firma que antecede expedida por el **MINISTERIO DE RELACIONES EXTERIORES** bajo el **No. 177889** del **28** de agost de **1998**, firmado por el Jefe de Legalizaciones.

(En español) Certificación de la existencia legal de SYNTHES AG CHUR y de la capacidad legal de MARGRIT JAQUES-BAUMANN para otorgar poder expedida por el Consulado de Colombia en Berna el día 11 de agosto de 1998, bajo el No. 000388. Firmado por RAFAEL ANTONIO TORRES MARTIN. Pagado impuesto de timbre y derechos consulares.

Legalización de la firma que antecede expedida por el **MINISTERIO DE RELACIONES EXTERIORES** bajo el **No. 177890** del **28** de agosto de **1998**, firmado por el Jefe de Legalizaciones.

Es traducción fiel y completa de la cual se acompaña esta oficina para su confrontación.

COLO-3261-701-001-5

Ago. 31/98

28 OCT 2003

TRADUCCION No.: 160898

MARIA ELVIRA MARTELO
Traductora e Interprete Oficial
Inglés - Español - Inglés
Res. No. 2879 Min. Justicia

COMO NOTARIO SEXTO DEL CIRCULO DE SANTAFE DE BOGOTA, HAGO CONSTAR QUE LA(S) FIRMA(S) DE

COINCIDE(N) CON LA FIRMA REGISTRADA POR EL (ELLOS) EN ESTA NOTARIA

SANTAFE DE BOGOTA, 02 SET 1998

PABLO MENDEZ BARAJAS

COMO NOTARIO SEXTO (6) DEL CIRCULO DE BOGOTA, HAGO CONSTAR QUE LA FOTOCOPIA COINCIDE CON EL ORIGINAL QUE ME FUE PRESENTADO A LA VISTA

8 OCT 2003

PABLO MENDEZ BARAJAS
NOTARIO (E)

MINISTERIO DE RELACIONES EXTERIORES

CUYA FIRMA APARECE EN EL DOCUMENTO DE SEMPEÑA LAS FUNCIONES INDICADAS

98 SEP -4 PM 12:23

DIRECCION DE TRATADOS

NO SE ASUME RESPONSABILIDAD DEL TEXTO

CAVELIER
ABOGADOS

EDIFICIO SISKI
CARRERA 4 No. 72 - 35
BOGOTA 8, COLOMBIA

WEB SITE: www.caveller-abogados.com
E-MAIL: caveller@colomsat.net.co

TELEFONO: (57) (1) 347-3611.
TELEFAX: (57) (1) 217-9211 (57) (1) 310-4995

Señor Jefe de la
DIVISION DE NUEVAS CREACIONES
Superintendencia de Industria y Comercio
E. S. D.

Poderdante: SYNTHES AG CHUR

Poder conferido el: 21-07-1998

Yo, GERMAN CAVELIER, obrando en mi calidad de apoderado principal del poderdante arriba mencionado, atentamente manifiesto a Usted que sustituyo el poder que me ha sido conferido en la persona del doctor EMILIO FERRERO, Abogado con Tarjeta Profesional No. 31.929, con todas las facultades que me fueron conferidas.

Hago la anterior sustitución conforme al artículo 66 del Código de Procedimiento Civil ya que los otros sustitutos faltan en este momento.

Señor Jefe,

GERMAN CAVELIER
T.P.A. No. 832
C.C. No. 2.877.924 de Bogotá

DEL CIRCULO
DE BOGOTA, HAGO CONSTAR QUE LA
FOTOCOPIA COINCIDE CON EL ORIGINAL
QUE HE TENIDO A LA VISTA
28 OCT 2003
PABLO MENDEZ
NOTARIO

Acepto:

EMILIO FERRERO
T.P.A. N° 31.929
C.C. No. 438.019 de Usaquén

2e-780-2

NOTARIA SEXTA DE BOGOTA

RECONOCIMIENTO Y PRESENTACION PERSONAL

Bogotá,.D. C. Diciembre 14/2001

Ante Mí, PABLO MENDEZ BARAJAS

NOTARIO SEXTO ENCARGADO DEL CIRCULO DE BOGOTA

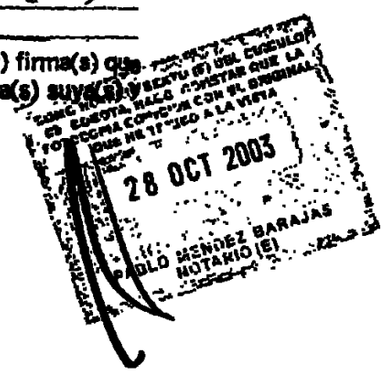
Compareció(eron)

quien(es) exhibió(eron) la(s) C. C. 287924 y 458019

y la(s) Libreta(s) Militar(es) 832 y 31929

domiciliado(s) en Bogotá y declaró(aron) que la(s) firma(s) que aparecen(n) en el presente documento es(son) la(s) suya(s) y que el contenido del mismo es cierto.

En constancia se firma esta Diligencia.



(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

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14 November 2002 (14.11.2002)

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(51) International Patent Classification[7]: A61B 17/72

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(22) International Filing Date: 3 May 2001 (03.05.2001)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except CA, US)*: SYNTHES AG CHUR [CH/CH]; Grabenstrasse 15, CH-7002 Chur (CH).

(71) Applicant *(for all designated States except CA)*: SYNTHES (U.S.A.) [US/US]; 1690 Russell Road, P.O. Box 1766, Paoli, PA 19301-1222 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: HEHLI, Markus [CH/CH]; Junkerboden, CH-7276 Davos Frauenkirch (CH). FERNANDEZ DELL'OCA, Alberto [UY/UY]; Av. Italia 2420, 11600 Montevideo (UY).

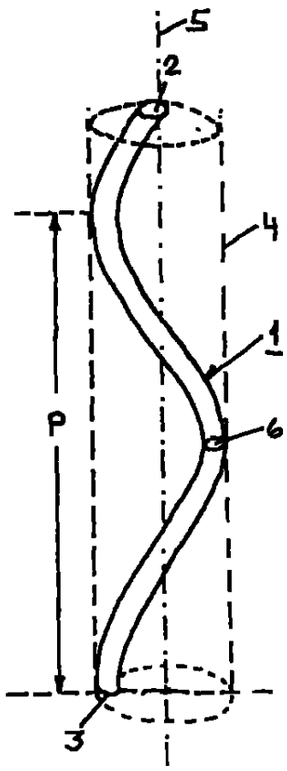
(74) Agent: LUSUARDI, Werther; Dr. Lusuardi AG, Kreuzbühlstrasse 8, CH-8008 Zürich (CH).

(81) Designated States *(national)*: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, 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, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

[Continued on next page]

(54) Title: OSTEOSYNTHETIC DEVICE



(57) Abstract: The osteosynthetic device (1) in form of an intramedullary nail has a longitudinal shape with a central axis (5), a first end (2) and a second end (3). The shape of the device (1) is based on the form of a helix.

WO 02/089683 A1

patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

— *with international search report*

OSTEOSYNTHETIC DEVICE

This invention relates to an osteosynthetic device according t the preamble of claim 1.

For the insertion of intramedullary nails the intramedullary canal has to be prepared first. Prior art intramedullary nails have therefore the following major disadvantages:

- the opening is bigger than the nail cross-section because of the bend of the nail; and
- the single bend at one point of the nail does not correspond to the anatomical shape of the medullary cavity of long bones.

Conventional nails forces the surgeon to use in proximal humerus a medial entry point which is located too medially, almost at the articular surface of the humerus, i.e. far from ideal from mechanical and vascular aspects of proximal humerus.

The present invention is designed to overcome the foregoing problems by providing an osteosynthetic device, particularly an intramedullary nail, which is capable of following the shape of the medullary cavity of long bones of humans. No oversized

opening is needed because the helix shape makes it possible to turn the nail during its insertion into the medullary cavity. The entry point of unreamed nails is optimised especially at the femur and the tibia but also in the humerus.

The main advantages of the device according to the invention are the following:

- it allows for a better placement of the entry hole of the nail into the bone avoiding risky points, as for instance, the danger of injuring the vascular supply of the femoral head; this lowers the complication rate and makes humerus nailing easier to perform;
- it does not require an entry hole larger than the cross-section of the nail; and
- it allows easy removal of the nail after bone healing.

Elastic intramedullary nails are not so useful in the adolescent/older child because they may be slightly unstable, requiring often the use of postoperative splints. The use of conventional nails in older children and adolescents is associated to a high risk of femoral head necrosis. A lateral entry points, of a thin constant section (no proximal thick part) can be a high bonus for these patents.

In the case of plates and/or of internal fixators according to the invention the main advantage is the possiblity to allow the implant to be - for instance - anterior in distal humerus and lateral in proximal humerus, avoiding the risk of radial n rve injury.

While one of the principal applications of the invention is as an intramedullary nail, the invention can also be applied t extramedullary devices, e.g. bone plates or internal fixators.

In the modification of a bone nail the device according to the invention may be used in the femur, humerus, tibia and radius.

In a preferred embodiment the envelope of the helix is a circular cylinder having the same central axis as the helix and the helix is running over less than 540°, preferably over less than 360°. The radius r of the circular cylinder purposefully is in the range of 10 to 50 mm, preferably in the range of 15 to 30 mm. The pitch p of the helix should be in the range of 100 to 1'500 mm, preferably in the range of 300 to 1000 mm.
The cross-section orthogonal to the central axis of the helix is preferably a circle, square or star.

In a further preferred embodiment the second end of the nail is pointed, which allows easier introduction into the bone.

In a further preferred embodiment the cross-section orthogonal to the central axis of the helix is essentially a rectangle with the sides a and b, the larger sides b being oriented to the outer and inner side of the helix. Purposefully the ratio of a:b is smaller than 0,50, preferably smaller than 0,35. Preferably the essentially rectangular cross-section is trimmed at its smaller sides a.

In a further preferred embodiment the portion of the helix nearer to the first end is thicker than the portion of the helix nearer to the second end. this allows for attachment of a handle to hold and manipulate the helix nail.

In a further preferred embodiment the central axis of the helix is a straight line.

In a further preferred embodiment the cross-section orthogonal to the central axis has a maximum dimension in the range of 5 to 14 mm and the length of the cylinder or of the helix is in the range of 200 to 500 mm.

In a further preferred embodiment the implant may be provided with lateral holes for locking screws.

The invention will be further described with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a device according to the

invention in the form of a helical nail;

Fig. 2 is a perspective view of a device according to the invention in the form of a helical plate;

Fig. 3 is a detail of the nail according to Fig. 1;

Fig. 4 is a detail of the plate according to Fig. 2;

Fig. 5 is a an orthogonal cross section through the nail according to Fig. 1;

Fig. 6 is a variation of the orthogonal cross section; and

Fig. 7 is a further variation of the orthogonal cross section.

The osteosynthetic device 1 according to the invention is represented in Fig. 1 in the form of an intramedullary nail. It has a longitudinal shape with a central axis 5, a first end 2 an a second end 3. The shape of the device 1 is based on the form of a helix which in geometry is a well-known configuration. The envelope of the helix as shown in Fig. 1 is a circular cylinder 4 having the same central axis 5 as the helix. The central axis 5 of the helix is a straight line. The helix is running over less than 540°, preferably over less than 360°. Typically the helix is running over 240°. The radius r of

the circular cylinder 4 is in the range of 10 to 50 mm, preferably in the range of 15 to 30 mm. The pitch p f the helix is range of 100 to 1'500 mm, preferably in the range of 300 to 1000 mm. As shown in Fig. 5 the cross-section orthogonal to the central axis 5 of the helix is a circle, i.e. the helix is made of a cylindrical rod. Alternatively as shown in Figs. 6 and 7 the cross-section may also have the shape of a square or a star (or may be fluted).

Another embodiment of the invention is represented in Fig. 2. It differs from the embodiment of Fig. 1 by the cross-secti n orthogonal to the central axis 5 which is not circular but rectangular, i.e. the helix is made of a flattened rod. In particular the cross-section 6 orthogonal to the central axis 5 of the helix is essentially a rectangle with the sides a and b, the larger sides b being oriented to the outer and inner side of the helix. Instead of a rectangular shape the cross-section could have an ellipsoidal shape, where a/2 and b/2 would be the half-axis of the ellipse. The ratio of a:b should be smaller than 0,50, preferably smaller than 0,35.

The portion of the helix nearer to the first end 2 is thicker than the portion of the helix nearer to the second end 3 this allowing attachment of a handle to hold and manipulate the device 1.

The cross-section orthogonal to the central axis 5 has a maximum dimension in the range of 5 to 14 mm.

As shown in Fig. 3 the second end 3 of the device 1 is p inted for easier introduction into the bone.

As shown in Fig. 4 the essentially rectangular cross-section of the device 1 is trimmed at its smaller sides a.

Figs. 5 to 7 show different cross-sections of the nail according to the invention.

The devices according to the invention may be made of any appropriate material, depending on the purpose to be served. They may be made of metals, for example an appropriate stainless steel, titanium or polymeric material in particular of composite nature.

Claims

1. An osteosynthetic device (1), in particular an intramedullary nail, having a longitudinal shape with a central axis (5), a first end (2) and a second end (3)
characterized in that
the shape of the device (1) is based on the form of a helix.

2. Device (1) according to claim 1, characterized in that the envelope of the helix is a circular cylinder (4) having the same central axis (5) as the helix.

3. Device (1) according to claim 1 or 2, characterized in that the helix is running over less than 540°, preferably over less than 360°.

4. Device (1) according to claim 2 or 3, characterized in that the radius r of the circular cylinder (4) is in the range of 10 to 50 mm, preferably in the range of 15 to 30 mm.

5. Device (1) according to one of the claims 1 to 4, characterized in that the pitch p of the helix is range of 100 to 1'500 mm, preferably in the range of 300 to 1000 mm.

6. Device (1) according to one of the claims 1 to 4, characterized in that the pitch p of the helix is larger than 400 mm, preferably larger than 600 mm.

7. Device (1) according to one of the claims 1 t 6, characterized in that a cross-section (6) orthogonal t the central axis (5) of the helix is a circle.

8. Device (1) according to one of the claims 1 t 6, characterized in that a cross-section (6) orthogonal to the central axis (5) of the helix is a square or star.

9. Device (1) according to one of the claims 1 to 8, characterized in that the second end (3) is pointed.

10. Device (1) according to one of the claims 1 to 9, characterized in that a cross-section (6) orthogonal t th central axis (5) of the helix is essentially a rectangle with the sides a and b, the larger sides b being oriented to the outer and inner side of the helix.

11. Device (1) according to claim 10, characterized in that the ratio of a:b is smaller than 0,50, preferably smaller than 0,35.

12. Device (1) according to claim 10 or 11, characterized in that the essentially rectangular cross-section is trimmed at its smaller sides a.

13. Device (1) according to one of the claims 1 to 12, characterized in that the portion of the helix nearer to the first end (2) is thicker than the portion of the helix nearer to the second end (3).

14. Device (1) according to one of the claims 1 to 13, characterized in that the central axis (5) of the helix is a straight line.

15. Device (1) according to one of the claims 1 to 14, characterized in that the cross-section orthogonal t the central axis (5) has a maximum dimension in the range of 5 to 14 mm, preferably in the range of 7 to 11 mm.

16. Device (1) according to one of the claims 1 to 15, characterized in that the length of the cylinder or of the helix is in the range of 200 to 500 mm, preferably in the range of 250 to 400 mm.

17. Device (1) according to one of the claims 1 to 16, characterized in that it is provided with through-going holes (7) for locking screws, preferably near the second end (3).

18. Device (1) according to one of the claims 1 to 17, characterized in that it is provided with at least two, preferably with at least three trough-going holes (7) for locking screws.

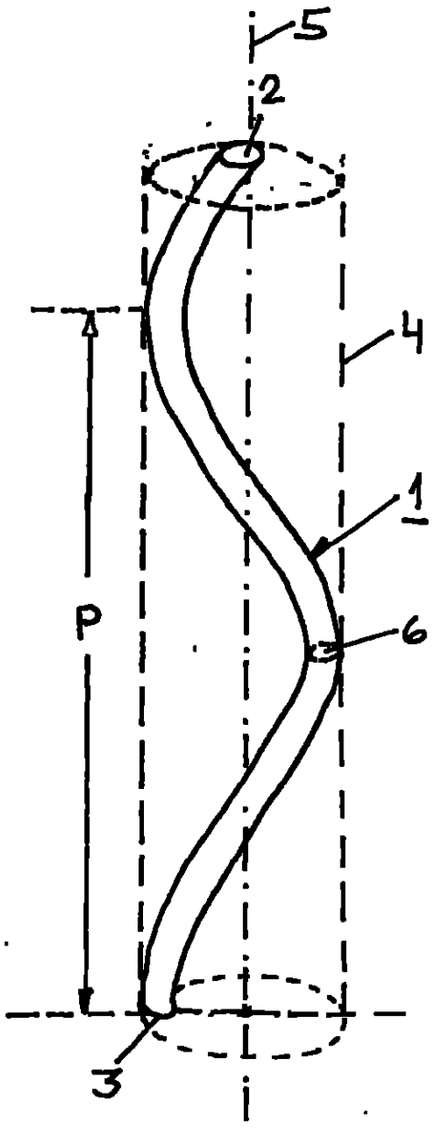


Fig. 1

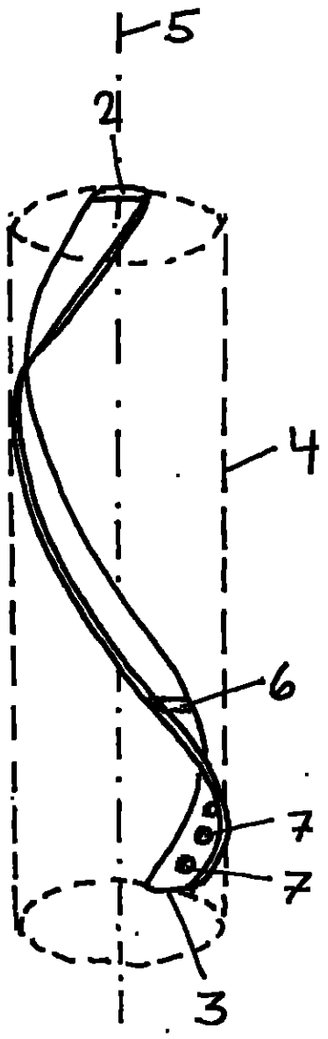


Fig. 2

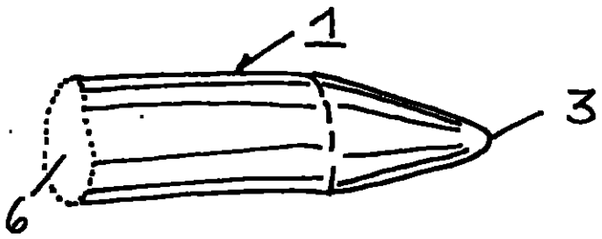


Fig. 3

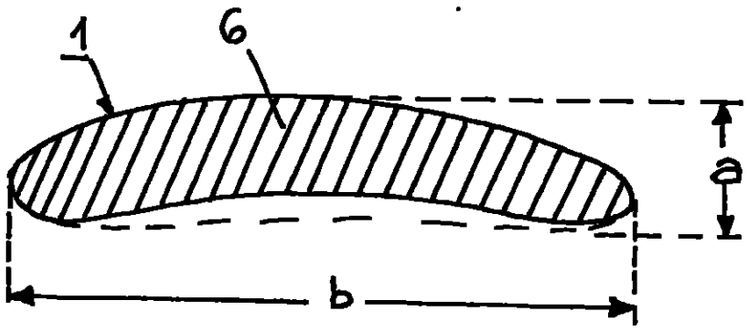


Fig. 4

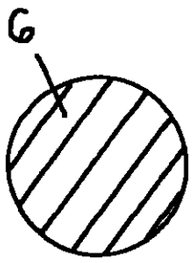


Fig. 5

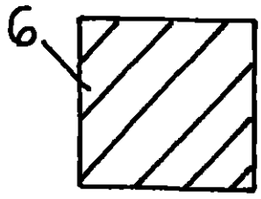


Fig. 6

Fig. 7

2.T

INTERNATIONAL SEARCH REPORT

Int Jonal Application No
PCT/CH 01/00276

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/72

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 7 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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 094 039 A (SCAGLIETTI OSCAR) 16 November 1983 (1983-11-16) page 2, line 24 -page 3, line 17 page 4, line 5 - line 8 figure 1	1-3,14, 16,17
Y		8-10,18
Y	GB 1 274 470 A (HALLORAN) 17 May 1972 (1972-05-17) page 4, line 81 - line 84; figures 19-23	8-10
A		1
Y	US 3 709 218 A (HALLORAN W) 9 January 1973 (1973-01-09) figure 2	18
	-/-	

[X] Further documents are listed in the continuation of box C. [X] 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	Date of mailing of the international search report
12 December 2001	20/12/2001

Name and mailing address of the ISA	Authorized officer
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INTERNATIONAL SEARCH REPORT

International Application No
PCT/CH 01/00276

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 174 312 B1 (LAMINGER KARL) 16 January 2001 (2001-01-16) column 2, line 3 - line 38; figures 1-5	1-4,7,9, 14
X	DE 38 35 682 A (LABITZKE REINER PROF DR MED HA) 26 April 1990 (1990-04-26) abstract; figure 2	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

In ional Application No
PCT/CH 01/00276

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0094039	A	16-11-1983	IT	1156599 B	04-02-1987
			AU	1416283 A	17-11-1983
			EP	0094039 A1	16-11-1983
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			EP	0913129 A1	06-05-1999
			WO	9922662 A1	14-05-1999
			AT	157896 A	15-10-1998
DE 3835682	A	26-04-1990	DE	3835682 A1	26-04-1990

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference *(if desired) (12 characters maximum)* 1810/PCT

Box No. I TITLE OF INVENTION

Osteosynthetic Device

Box No. II APPLICANT ☐ This person is also inventor

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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Telephone No.

Facsimile No.

Teleprinter No.

Applicant's registration No. with the Office

State *(that is, country)* of nationality: CH

State *(that is, country)* of residence: CH

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☒ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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This person is:
☒ applicant only
☐ applicant and inventor
☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality: US

State *(that is, country)* of residence: US

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☒ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

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Telephone No. 01/ 251 66 92

Facsimile No. 01/251 75 74

Teleprinter No.

Agent's registration No. with the Office

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Sheet No. ...2...

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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Switzerland

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality: CH

State *(that is, country)* of residence: CH

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

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Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

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11600 Montevideo
Uruguay

This person is:
- ☐ applicant only
- ☒ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality: UY

State *(that is, country)* of residence: UY

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

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Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

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Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- ☐ applicant only
- ☐ applicant and inventor
- ☐ inventor only *(If this check-box is marked, do not fill in below.)*

Applicant's registration No. with the Office

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

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☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.

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Regional Patent

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Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)*

Sheet No. ...4...

Supplemental Box *If the Supplemental Box is not used, this sheet should not be included in the request.*

1. If, in any of the Boxes, except Boxes Nos. VIII(i) to (v) for which a special continuation box is provided, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No...." (indicate the number of the Box) and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

(i) If more than two persons are to be indicated as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;

(ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;

(iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;

(iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;

(v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;

(vi) if, in Box No. VI, there are more than five earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI.

2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.

Continuation of Box No. II

Applicant for all states with exception of the United States of America and Canada:

Synthes AG Chur
Grabenstrasse 15
CH- 7002 Chur
Switzerland

Continuation of Box No. III

Applicant for Canada only:

Synthes (U.S.A.)
1690 Russell Road
P. O. Box 1766
Paoli, PA 19301- 1222
USA

Box No. VI PRIORITY CLAIM

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application *(day/month/year)*	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application:* regional Office	international application: receiving Office
item (1)				
item (2)				
item (3)				
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office)* identified above as:

☐ all items ☐ item (1) ☐ item (2) ☐ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box

* *Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii))*: . . . .

. . . . . .

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)*:

ISA / . . . . . .

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority)*:

Date *(day/month/year)* Number Country *(or regional Office)*

Box No. VIII DECLARATIONS

The following declarations are contained in Boxes Nos. VIII (i) to (v) *(mark the applicable check-boxes below and indicate in the right column the number of each type of declaration)*:		Number of declarations
☐ Box No. VIII (i)	Declaration as to the identity of the inventor :	
☐ Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent :	
☐ Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application :	
☐ Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America) :	
☐ Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty :	

Sheet No. 6

Box No. IX CHECK LIST; LANGUAGE OF FILING

This international application contains:

(a) in paper form, the following number of sheets:

request (including declaration sheets)	:	6
description (excluding sequence listings and/or tables related thereto)	:	7
claims	:	4
abstract	:	1
drawings	:	2
Sub-total number of sheets	:	20
sequence listings	:	
tables related thereto	:	
(for both, actual number of sheets if filed in paper form, whether or not also filed in computer readable form: see (c) below)		
Total number of sheets	:	20

(b) ☐ only in computer readable form (Section 801(a)(i))
- (i) ☐ sequence listings
- (ii) ☐ tables related thereto

(c) ☐ also in computer readable form (Section 801(a)(ii))
- (i) ☐ sequence listings
- (ii) ☐ tables related thereto

Type and number of carriers (diskette, CD-ROM, CD-R or other) on which are contained the
- ☐ sequence listings: .....
- ☐ tables related thereto: .....

(additional copies to be indicated under items 9(ii) and/or 10(ii), in right column)

This international application is accompanied by the following item(s) *(mark the applicable check-boxes below and indicate in right column the number of each item)*: — Number of items

1. ☒ fee calculation sheet :
2. ☒ original separate power of attorney :
3. ☐ original general power of attorney :
4. ☐ copy of general power of attorney; reference number, if any: ..... :
5. ☐ statement explaining lack of signature :
6. ☐ priority document(s) identified in Box No. VI as item(s): ..... :
7. ☐ translation of international application into *(language)*: ..... :
8. ☐ separate indications concerning deposited microorganism or other biological material :
9. ☐ sequence listings in computer readable form *(indicate type and number of carriers)*
   - (i) ☐ copy submitted for the purposes of international search under Rule 13*ter* only (and not as part of the international application) :
   - (ii) ☐ *(only where check-box (b)(i) or (c)(i) is marked in left column)* additional copies including, where applicable, the copy for the purposes of international search under Rule 13*ter* :
   - (iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listings mentioned in left column :
10. ☐ tables in computer readable form related to sequence listings *(indicate type and number of carriers)*
    - (i) ☐ copy submitted for the purposes of international search under Section 802(b-*quater*) only (and not as part of the international application) :
    - (ii) ☐ *(only where check-box (b)(ii) or (c)(ii) is marked in left column)* additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-*quater*) :
    - (iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column :
11. ☐ other *(specify)*: ..... :

Figure of the drawings which should accompany the abstract: 1

Language of filing of the international application: English

Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

Dr. Lusuardi AG

P. Kaiser May 2, 2001

For receiving Office use only

1. Date of actual receipt of the purported international application:
2. Drawings: ☐ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
4. Date of timely receipt of the required corrections under PCT Article 11(2):
5. International Searching Authority (if two or more are competent): ISA /
6. ☐ Transmittal of search copy delayed until search fee is paid

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

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WO 02/089683
PCT/CH01/00027

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

LUSUARDI, Werther
Dr. Lusuardi AG
Kreuzbühlstrasse 8
CH-8008 Zürich
SUISSE

Date of mailing (day/month/year).	
14 November 2002 (14.11.02)	
Applicant's or agent's file reference.	IMPORTANT NOTICE
1810/PCT	

International application No.	International filing date (day/month/year)	Priority date (day/month/year)
PCT/CH01/000276	03 May 2001 (03.05.01)	

Applicant

SYNTHES AG CHUR, et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

   KP, KR, US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

   AE, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW

   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-*bis*)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 14 November 2002 (14.11.02) under No. WO 02/089683.

4. **TIME LIMITS for filing a demand for international preliminary examination and for entry into the national phase**

   The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of 19 months from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

   In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at http://www.wipo.int/pct/en/index.html.

   For filing a demand for international preliminary examination, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

   It is the applicant's sole responsibility to monitor all these time limits.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.(41-22) 740.14.35

Authorized officer

Judith Zahra

Telephone No.(41-22) 338.91.11

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PATENT COOPERATION TREATY

21 Dez. 2001

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

To:
DR. LUSUARDI AG
Attn. Lusuardi, Werther
Kreuzbühlstrasse 8
CH-8008 Zürich
SWITZERLAND

Date of mailing *(day/month/year)* 20/12/2001	
Applicant's or agent's file reference 1810/PCT	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/CH 01/00276	International filing date *(day/month/year)* 03/05/2001
Applicant SYNTHES AG CHUR et al.	

1. [X] The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

   Filing of amendments and statement under Article 19:
   The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

   When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet.

   Where? Directly to the International Bureau of WIPO
   34, chemin des Colombettes
   1211 Geneva 20, Switzerland
   Facsimile No.: (41-22) 740.14.35

   For more detailed instructions, see the notes on the accompanying sheet.

2. [ ] The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. [ ] With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

   [ ] the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

   [ ] no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

   Shortly after 18 months from the priority date, the International application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90*bis*.1 and 90*bis*.3, respectively, before the completion of the technical preparations for international publication.

   Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

   Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Raoul Emme

Form PCT/ISA/220 (July 1998)

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped),whether

(i) the claim is unchanged;

(ii) the claim is cancelled;

(iii) the claim is new;

(iv) the claim replaces one or more claims as filed;

(v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."

2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."

3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."

4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequences with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

BNSDOCID: <XISA220NOENP4.1 >

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
1810/PCT		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/CH 01/ 00276	03/05/2001	

Applicant

SYNTHES AG CHUR et al.

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] Certain claims were found unsearchable (See Box I).

3. [ ] Unity of invention is lacking (see Box II).

4. With regard to the title,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the abstract,

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 1

   [X] as suggested by the applicant.

   [ ] None of the figures.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

BNSDOCID: <XISA220NOENP4_L>

INTERNATIONAL SEARCH REPORT

International Application No
PCT/CH 01/00276

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/72

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 7 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)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 094 039 A (SCAGLIETTI OSCAR) 16 November 1983 (1983-11-16) page 2, line 24 -page 3, line 17 page 4, line 5 - line 8 figure 1	1-3,14, 16,17
Y		8-10,18
Y	GB 1 274 470 A (HALLORAN) 17 May 1972 (1972-05-17) page 4, line 81 - line 84; figures 19-23	8-10
A		1
Y	US 3 709 218 A (HALLORAN W) 9 January 1973 (1973-01-09) figure 2	18

-/—

[X] Further documents are listed in the continuation of box C. [X] Patent family members are listed in annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier document but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
12 December 2001	20/12/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Ducreau, F

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/CH 01/00276

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 174 312 B1 (LAMINGER KARL) 16 January 2001 (2001-01-16) column 2, line 3 - line 38; figures 1-5	1-4,7,9, 14
X	DE 38 35 682 A (LABITZKE REINER PROF DR MED HA) 26 April 1990 (1990-04-26) abstract; figure 2	1-3

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/CH 01/00276

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0094039 A	16-11-1983	IT 1156599 B	04-02-1987
		AU 1416283 A	17-11-1983
		EP 0094039 A1	16-11-1983
		ES 272095 U	16-10-1983
		JP 58206739 A	02-12-1983
GB 1274470 A	17-05-1972	CH 492447 A	30-06-1970
		DE 1930354 A1	18-12-1969
US 3709218 A	09-01-1973	NONE	
US 6174312 B1	16-01-2001	AT 405127 B	25-05-1999
		EP 0913129 A1	06-05-1999
		WO 9922662 A1	14-05-1999
		AT 157896 A	15-10-1998
DE 3835682 A	26-04-1990	DE 3835682 A1	26-04-1990

DISPOSITIVO OSTEOSINTETICO

La presente invención se refiere a un dispositivo para la osteosíntesis de acuerdo con el preámbulo de la reivindicación 1.

Para la inserción de clavos intramedulares es necesario preparar primero l canal intramedular. Por esta razón, los clavos intramedulares del arte anterior presentan las siguientes desventajas:

.- la abertura es mas grande que la sección transversal del clavo, debido a la curvatura del clavo; y

.- la curvatura simple en uno de los puntos del clavo no se corresponde con la configuración anatómica de la cavidad medular de los huesos largos.

Los clavos convencionales obligan al cirujano a utilizar en la parte proximal del húmero un punto de entrada medial que está situado en una posición excesivamente medial, casi en la superficie articular del húmero, es decir, lejos de lo ideal desde los puntos de vista mecánico y vascular de la parte proximal del húmero.

La presente invención tiene por objeto superar los problemas recién mencionados mediante la provisión de un dispositivo de osteosíntesis, particularmente un clavo intramedular, que es capaz de seguir la configuración de la cavidad medular de los huesos largos de los seres humanos. No se necesita ninguna abertura sobredimensionada, dada que la hélice permite hacer girar el clavo durante su inserción en la cavidad medular. El punto de entrada de los clavos, sin escariar, es optimizado de manera especial en el fémur y en la tibia, pero también en el húmero.

Las principales ventajas del dispositivo de acuerdo con la invención, son las siguientes:

.- permite una mejor colocación del orificio de entrada del clavo en el hueso, evitándose los puntos de riesgo, tales como por ejemplo el peligro de lesionar el suministro vascular de la cabeza del fémur; esto disminuye la frecuencia de complicaciones y hace que sea mas fácil llevar a cabo el clavado del húmero;

.- no requiere un orificio de entrada que sea mayor que el orificio de entrada del clavo; y

.- permite una fácil remoción del clavo después de la curación d l hueso.

Los clavos intramedulares elásticos no son tan útiles en adolescentes y niños mayores ya que pueden ser ligeramente estables, y frecuentemente requieren la utilización de entablillados post-operativos. La utilización de clavos convencionales en los niños mayores y en los adolescentes está asociada con un elevado riesgo de necrosis de la cabeza del fémur. Un punto de entrada lateral, de una sección delgada constante (sin parte proximal gruesa) puede ser una elevada bonificación para estos pacientes.

En el caso de las placas y/o de fijadores internos de acuerdo con la invención, la principal ventaja consiste en la posibilidad de permitir que el implante sea - por ejemplo- anterior en la parte distal del húmero y lateral en la parte proximal del húmero, con lo cual se evita el riesgo de lesionar el nervio radial.

Si bien una de las principales aplicaciones de la invención es como clavo intramedular, la invención también puede ser aplicada a los dispositivos extramedulares, por ejemplo, a las placas para osteosíntesis o fijadores internos.

En las modificaciones de un clavo osteológico, el dispositivo de acuerdo con la invención puede ser utilizado en el fémur, húmero, tibia y radio.

En una forma de realización preferida, la envoltura de la hélice es un cilindro circular que tiene el mismo eje central que la hélice, y la hélice se extiende en menos de 540 grados, preferiblemente en menos de 360 grados. Es conveniente que el radio r del cilindro circular se halle en el intervalo de 10 a 50 mm, preferiblemente en el intervalo de 15 a 30 mm. El paso p de la hélice debería estar en el intervalo de 100 a 1.500 mm, preferiblemente en el intervalo de 300 a 1000 mm.

La sección transversal ortogonal, referida al eje central de la hélice es preferiblemente un circulo, cuadrado o estrella.

En otra forma de realización preferida, la segunda extremidad d l clavo tiene una punta, lo cual permite su introducción mas fácil en el hueso.

En otra forma de realización preferida, la sección transversal ortogonal referida al eje central de la hélice es esencialmente un rectángulo con los lados a y b, estando los ejes b mas grandes orientados hacia el lado exterior interior de la hélice. Es conveniente que la relación a/b sea menor de 0,5, preferiblemente menor de 0,35. Es preferible que la sección transversal esencialmente rectangular esté recortado en sus lados a mas pequeños.

En otra forma de realización, la porción de la hélice mas cercana a la primera extremidad es mas gruesa que la porción de la hélice mas cercana a su segunda extremidad. Esto permite las fijación de una empuñadura o mango para sostener y manipular el clavo helice.

En otra forma de realización preferida, el eje central de la hélice es una línea recta.

En otra forma de realización, la sección transversal ortogonal con respecto al eje central tiene una dimensión máxima en el intervalo de 5 a 14 mm, y la longitud del cilindro o de la hélice se halla en el intervalo de 200 a 500 mm.

En otra forma de realización preferida, el implante puede estar provisto con orificios laterales para tornillos de traba.

La invención será descrita con mayor detalle haciendo referencia a los dibujos adjuntos en los cuales:

La Figura 1 es una vista en perspectiva, de un dispositivo de acuerdo con la invención, con la forma de un tornillo helicoidal;

La Figura 2 es una vista en perspectiva, de un dispositivo de acuerdo con la invención, en la forma de una placa helicoidal;

La Figura 3 es un detalle del clavo de acuerdo con la Figura 1;

La Figura 4 es un detalle de la placa de acuerdo con la reivindicación 2;

La Figura 5 es una sección transversal ortogonal a través del clavo de acuerdo con la Figura 1;

La Figura 6 es una variación de la sección transversal ortogonal; y

La Figura 7 es otra variación de la sección transversal ortogonal.

El dispositivo de osteosíntesis de acuerdo con la invención ha sido representado en la Figura 1 en la forma de un una clavo intramedular. Tiene una configuración longitudinal con un eje central, 5, una primera extremidad, 2, y una segunda extremidad, 3. La configuración del dispositivo 1 se basa en la forma de una hélice, que es una configuración geométrica bien conocida. La envoltura de la hélice, tal como se muestra en la Figura 1, es un cilindro circular 4 que tiene el mismo eje central 5 que la helice. El eje central 5 de la hélice es una línea recta. La hélice se extiende en menos de 540 grados, preferiblemente sobre menos de

360 grados. Típicamente, la hélice se extiende en 240 grados. El radio r del cilindro circular 4 de halla en el intervalo de 15 a 30 mm. El paso p de la hélice se halla en el intervalo de 100 a 1.500 m, preferiblemente en el intervalo de 300 a 1.000 mm. Tal como se muestra en la Figura 5, la sección transversal ortogonal con respecto al eje central 5 de la hélice es un circulo, es decir, la hélice está hecha de una varilla cilíndrica. Como alternativa, tal como se muestra en las Figuras 6 y 7, la sección transversal también puede tener la configuración de un cuadrado o de una estrella (o puede estar estriada/acanalada).

En la Figura 2 se representa otra forma de realización de la invención. Difiere de la forma de realización de la Figura 1 en que la sección transversal ortogonal con respecto al eje central 5 no es circular sino rectangular, es decir, la hélice está hecha de una varilla aplanada. En particular, la sección transversal 6 ortogonal al eje central 5 de la hélice es esencialmente un rectángulo con los lados a y b, estando los lados mayores b orientados hacia el lado exterior e interior de la hélice. En lugar de una forma rectangular, la sección transversal podría tener una forma elipsoidal, siendo a/2 y b/2 los semi-ejes de la elipse. La relación a/b debería ser menor a 0,50, preferiblemente menor de 0,35.

La porción de la hélice mas cercana a la primera extremidad 2, es mas gruesa que la porción de la hélice mas cercana a la segunda extremidad 3; esto permite la fijación de una empuñadura o mango para sostener y manipular el dispositivo 1.

La sección transversal ortogonal con respecto el eje central 5 tiene una dimensión máxima en el intervalo de 5 a 14 mm.

Tal como se muestra en la Figura 3, la segunda extremidad del dispositivo 1 apunta hacia el hueso, para su introducción mas fácil.

REIVINDICACIONES

Habiendo así especialmente descrito y determinado la naturaleza de la presente invención y la manera cómo la misma ha de ser llevada a la práctica, se declara reivindicar como de propiedad y derecho exclusivo:

1.- Un dispositivo para la osteosíntesis, (1), en particular un clavo intramedular, que tiene una forma longitudinal con un eje central (5), una primera extremidad (2) y una segunda extremidad (3), caracterizado porque la configuración del dispositivo (1) está basado en la forma de una hélice.

2.- Dispositivo (1) de acuerdo con la reivindicación 1, caracterizado porque la envoltura de la helice es un cilindro circular (4) que tiene el mismo eje central que la helice.

3.- Dispositivo (1) de acuerdo con la reivindicación 1 ó 2, caracterizado porque la hélice se desarrolla en menos de 540 grados, preferiblemente en menos de 360 grados.

4.- Dispositivo (1) de acuerdo con la reivindicación 2 ó 3, caracterizado porque el radio r del cilindro circular (4) se halla en el intervalo de 10 a 50 mm, preferiblemente en el intervalo de 15 a 30 mm.

5.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 4, caracterizado porque el paso p de la hélice se halla en el intervalo de 100 a 1.500 mm, preferiblemente en el intervalo de 300 a 1.000 mm.

6.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 4, caracterizado porque el paso p de la hélice es mayor de 440 mm, preferiblemente mayor de 600 mm.

Tal como se muestra en la Figura 4, la sección transversal, esencialmente rectangular, del dispositivo 1, está recortada en sus lados a mas pequeños.

En las Figuras 5 a 7 se muestran diferente secciones transversales del clavo de acuerdo con la invención.

Los dispositivos de acuerdo con la invención pueden ser hechos de cualquier material adecuado, en función de la finalidad prevista. Pueden estar hechas de metales, por ejemplo de un acero inoxidable adecuado, titanio, o material polimérico, en particular de naturaleza composite.

7.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 6, caracterizado porque una sección transversal (6) ortogonal al respecto al eje central (5) de la hélice, es un circulo.

8.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 6, caracterizado porque la sección transversal ortogonal con respecto al eje central (5) de la hélice, es un cuadrado o una estrella.

9.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 8, caracterizado porque la segunda extremidad (3) termina en una punta.

10.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 9, caracterizado porque una sección transversal (6) ortogonal con respecto al eje central (5) de la hélice es esencialmente un rectángulo con lados a y b, estando los lados mas grandes, b, orientados hacia el lado exterior e interior de la hélice.

11.- Dispositivo (1) de acuerdo con la reivindicación 10, caracterizado porque la relación a/b es menor de 0,50, preferiblemente menor de 0,35.

12.- Dispositivo (1) de acuerdo con la reivindicación 10 u 11, caracterizado porque la sección transversal, esencialmente rectangular, está recortada en sus lados menores a.

13.- Dispositivo (13) de acuerdo con una cualquiera de las reivindicaciones 1 a 12, caracterizado porque la porción de la hélice mas cercana a la primera extremidad (2) es mas gruesa que la porción de la hélice mas cercana a la segunda extremidad (3).

14.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 13, caracterizado porque el eje central (5) de la hélice es una línea recta.

15.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 14, caracterizado porque la sección transversal ortogonal con respecto al je central (5) tiene una dimensión máxima en el intervalo de 5 a 14 mm, preferiblemente en el intervalo de 7 a 11 mm.

16.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 15, caracterizado porque la longitud l del cilindro o de la hélice se halla en el intervalo de 200 a 500 mm, preferiblemente en el intervalo de 250 a 400 mm.

17.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 16, caracterizado porque está provisto con orificios pasantes (7) para tornillos de bloqueo, preferiblemente cercanos a la segunda extremidad (3).

18.- Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 17, caracterizado porque está provisto con por lo menos dos, preferiblemente con por lo menos tres, orificios pasantes (7) para tornillos de bloqueo.

RESUMEN

El dispositivo para la osteosíntesis, (1), en forma de un clavo intramedular, tiene una configuración longitudinal con un eje central (5), una primera extremidad (2) y una segunda extremidad (3).

La configuración del dispositivo (1) está basada en la forma de una hélice.

,52

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

LUSUARDI, Werther
LUSUARDI AG
Kreuzbühlstrasse 8
CH-8008 Zürich
SUISSE

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	21.02.2003
Applicant's or agent's file reference 1810/PCT	IMPORTANT NOTIFICATION

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CH01/00276	03/05/2001	03/05/2001

Applicant
SYNTHES AG CHUR et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

For the purpose of deciding whether the claimed invention is patentable or not, the elected Offices may apply criteria additional to or different from the criteria on which the international preliminary examination report is based (see Articles 27(5), 33(5)). Additional criteria may include e.g. exemptions from patentability and the requirements of enabling disclosure and of clarity and support of claims.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	San Miguel, E Tel.+49 89 2399-7414

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
1810/PCT		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/CH01/00276	03/05/2001	03/05/2001
International Patent Classification (IPC) or national classification and IPC A61B17/72		
Applicant SYNTHES AG CHUR et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
30/10/2002	21.02.2003
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Storer, J Telephone No. +49 89 2399 7247

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CH01/00276

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-7	as originally filed			

Claims, No.:

1-18	as received on	19/12/2002	with letter of	16/12/2002

Drawings, sheets:

1/2,2/2	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   - ☐ the description, pages:
   - ☐ the claims, Nos.:

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/CH01/00276

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-18
	No:	Claims
Inventive step (IS)	Yes:	Claims 1-18
	No:	Claims
Industrial applicability (IA)	Yes:	Claims 1-18
	No:	Claims

2. Citations and explanations
see separate sheet

Re Item V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

The application refers to an osteosynthetic device having a longitudinal shape based on the form of a helix. The closest prior art is EP-A-0094039 (D1), which defines the preamble of claim 1.

The problem addressed by the invention is how to provide a substantially stiff osteosynthetic device which may be inserted through a relatively small opening in the bone and which better corresponds to the anatomy of the medullary cavity into which it is inserted.

The problem is solved by arranging the cross-section orthogonal to the central axis to have a maximum dimension in the range of 5 mm to 15 mm and the helix to run over less than 540° with a pitch in the range of 100 mm to 1500 mm.

The invention involves the special selection of ranges of values for parameters defining the helix which are not obvious to the person skilled in the art. Hence, claim 1 is considered to be both novel and inventive. The industrial applicability of the invention is self evident, therefore claim 1 satisfies the conditions of Article 33(2)-(4) PCT. Since claims 2-18 are dependent on claim 1, these likewise satisfy the requirements of the PCT with respect to novelty, inventive step and industrial applicability.

The document D1 is not cited in the description contrary to Rule 5.1(a)(ii) PCT.

The description has not been brought into line with the claims as required by Rule 5.1(a)(iii) PCT.

1810/PCT

5.12.2002

Claims

1. An osteosynthetic device (1), in particular an intramedullary nail, having a longitudinal shape with a central axis (5), a first end (2) and a second end (3), the shape of the device (1) being based on the form of a helix,
characterized in that
a) the cross-section orthogonal to the central axis (5) has a maximum dimension in the range of 5 to 14 mm;
b) the helix is running over less than 540°; and
c) the pitch p of the helix is in the range of 100 to 1'500 mm.

2. Device (1) according to claim 1, characterized in that the helix is running over less than 360°.

3. Device (1) according to claim 1 or 2, characterized in that the cross-section orthogonal to the central axis (5) has a maximum dimension in the range of 7 to 11 mm.

4. Device (1) according to one of the claims 1 to 3, characterized in that the pitch p of the helix is in the range of 300 to 1000 mm.

5. Device (1) according to one of the claims 1 to 4, characterized in that the pitch p of the helix is larger than 400 mm, preferably larger than 600 mm.

6. Device (1) according to one of the claims 1 t 5, characterized in that the envelope of the helix is a circular cylinder (4) having the same central axis (5) as the helix.

7. Device (1) according to one of the claims 1 t 6, characterized in that the radius r of the circular cylinder (4) is in the range of 10 to 50 mm, preferably in the range f 15 t 30 mm..

8. Device (1) according to one of the claims 1 to 7, characterized in that a cross-section (6) orthogonal to the central axis (5) of the helix is a circle.

9. Device (1) according to one of the claims 1 to 7, characterized in that a cross-section (6) orthogonal to the central axis (5) of the helix is a square or star.

10. Device (1) according to one of the claims 1 t 9, characterized in that the second end (3) is pointed.

11. Device (1) according to one of the claims 1 to 10, characterized in that a cross-section (6) orthogonal to the central axis (5) of the helix is essentially a rectangle with the sides a and b, the larger sides b being oriented t the uter and inner side of the helix.

12. Device (1) according to claim 11, characterized in that the ratio of a:b is smaller than 0,50, preferably smaller than 0,35.

13. Device (1) according to claim 11 or 12, characterized in that the essentially rectangular cross-section is trimmed at its smaller sides a.

14. Device (1) according to one of the claims 1 to 13, characterized in that the portion of the helix nearer to the first end (2) is thicker than the portion of the helix nearer to the second end (3).

15. Device (1) according to one of the claims 1 to 14, characterized in that the central axis (5) of the helix is a straight line.

16. Device (1) according to one of the claims 1 to 15, characterized in that the length of the cylinder or of the helix is in the range of 200 to 500 mm, preferably in the range of 250 t 400 mm.

17. Device (1) according to one of the claims 1 t 16, characterized in that it is provided with through-going holes (7) for locking screws, preferably near the second end (3).

18. Device (1) according to one of the claims 1 t 17, characterized in that it is provided with at least two, preferably with at least three trough-going holes (7) for locking screws.

TRATADO DE COOPERACIÓN SOBRE PATENTES

PCT

INFORME DE EXAMEN INTERNACIONAL PRELIMINAR

(PCT Artículo 36 y Norma 70)

Referencia Expediente Solicitante o Agente 1810/PCT	Véase notificación transmisión Informe Examen Internacional Preliminar (Formato PCT/IPEA/416) PARA OTRAS ACCIONES	
Solicitud Internacional No. PCT/CH01/00276	Fecha Presentación Internacional (*día/mes/año*) 03 mayo 2001 (03.05.01)	Fecha Prioridad (*día/mes/año*) 03 mayo 2001 (03.05.01)
Clasificación Internacional de Patentes (IPC) o clasificación nacional e IPC A61B 17/72		
Solicitante SYNTHES AG CHUR et al.		

1. Este informe de examen internacional preliminar ha sido preparado por la Autoridad encargada de Exámenes Internacionales Preliminares y se transmite al solicitante de acuerdo con el Artículo 36.

2. Este INFORME comprende un total de 4 páginas, incluyendo esta carátula.

☒ Este informe también lleva ANEXOS, v.g., hojas de descripción, reivindicaciones y/o dibujos que han sido modificados y son la base de este informe y/u hojas con rectificaciones efectuadas ante esta Autoridad (véase norma 70.16 y Sección 607 de las Instrucciones administrativas bajo el PCT.

Estos anexos consisten en un total de 4 páginas.

Este informe contiene indicaciones relacionadas con los siguientes puntos:

I	☒	Base del informe
II	☐	Prioridad
III	☐	No establecimiento de concepto sobre novedad, nivel inventivo y aplicabilidad industrial
IV	☐	Falta de unidad de invención
V	☒	Declaración fundamentada bajo el Artículo 35(2) con respecto a novedad, nivel inventivo o aplicabilidad industrial; referencias y explicaciones que respaldan dicha declaración
VI	☐	Ciertos documentos citados
VII	☐	Ciertos defectos en la solicitud internacional
VIII	☐	Ciertas observaciones sobre la solicitud internacional

Fecha de presentación de la demanda 30 de octubre de 2002 (30.10.02)	Fecha terminación de este informe 21 de febrero de 2003 (21.02.2003)
Nombre y dirección postal de Autoridad Encargada del Examen Preliminar Oficina Europea de Patentes D-80298 Munich Tel. +49 89 2399 – 0 Tx: 523656 epmu d Facsímil +49 89 2399 - 4465	Funcionario autorizado Storer, J Teléfono No. +49 89 2399 7247

REPORTE DE EXAMEN PRELIMINAR INTERNACIONAL

Solicitud Internacional No. PCT/CH01/00276

I. **Base del Informe**

1. Con respecto a los **elementos** de la solicitud internacional: *(Los folios sustitutivos que le han sido entregados a la Oficina receptora en respuesta a una invitación extendida según lo previsto en el Artículo 14 se refieren a este informe "tal como se presentó originalmente" y no se anexan al presente informe porque no contienen modificaciones (Normas 70.16 y 70.17).*

Descripción, páginas

1-7 tal como se presentó originalmente

Reivindicaciones, No.:

1-18 tal como se recibieron el 19/12/2002 con carta del 16/12/2002

Dibujos, páginas:

1/2,2/2 tal como se presentaron originalmente

2. Con respecto al **idioma**, todos los elementos marcados arriba estaban disponibles o se le presentaron a esta Autoridad en el idioma en el cual se presentó la solicitud internacional, a menos que se indique lo contrario en este artículo.

Estos elementos se pusieron a disposición de esta Autoridad en el siguiente idioma _____ el cual es:

☐ El idioma de una traducción presentada para propósitos de búsqueda internacional (según la norma 23.1(b)).

☐ El idioma de publicación de la solicitud internacional

☐ El idioma de la traducción presentada para propósitos del examen preliminar (según las Normas 55.2 o 55.3).

3. Con respecto a cualquier **secuencia de nucleótidos o aminoácidos** revelada en la solicitud internacional, el examen internacional preliminar se llevó a cabo con base en los listados de secuencias

   ☐ Contenidos en la solicitud internacional en forma escrita

   ☐ Presentados juntos con la solicitud internacional en forma de archivo electrónico

   ☐ Presentados más adelante a esta Autoridad en forma escrita

   ☐ Presentados más adelante en forma de archivo electrónico

   ☐ Se ha adjuntado la declaración de que el listado de secuencia presentado más adelante por escrito no va más allá de la revelación contenida en la solicitud internacional tal como ha sido presentada

   ☐ Se ha adjuntado la declaración de que la información registrada en forma de archivo electrónico es idéntica a los listados escritos de secuencias

4. Las modificaciones han dado lugar a la cancelación de:

   ☐ La descripción, páginas

   ☐ Las reivindicaciones, Nos.

   ☐ Las ilustraciones, folios / figuras

5. ☐ Este informe ha sido establecido como si (algunas de) las modificaciones no se hubiesen realizado, ya que se ha considerado que van más allá de la revelación tal como ha sido presentada, según lo previsto en la Casilla Complementaria (Norma 70.2(c)).

   (Cualquier folio sustitutivo que contenga una modificación de esta naturaleza deberá ir referenciado en el numeral 1 y anexo al presente informe.)

6. Observaciones adicionales, si es necesario:

V. Declaración razonada conforme al Artículo 35(2) en lo que respecta a la novedad, el nivel inventivo o la aplicabilidad industrial; citas y explicaciones en respaldo de dicha declaración

1. Declaración

Novedad (N)	Reivindicaciones	1-18	SÍ

	Reivindicaciones		NO
Nivel inventivo (NI)	Reivindicaciones	1-18	SÍ
	Reivindicaciones		NO
Aplicabilidad industrial	Reivindicaciones	1-18	SÍ
	Reivindicaciones		NO

2. Citas y explicaciones: **Véase página separada.**

REPORTE DE EXAMEN Solicitud Internacional No. PCT/CH01/00276

PRELIMINAR INTERNACIONAL – PÁGINA SEPARADA

Re Item V

Declaración razonada conforme al Artículo 35(2) en lo que respecta a la novedad, el nivel inventivo o la aplicabilidad industrial; citas y explicaciones en respaldo de dicha declaración

La solicitud se refiere a un dispositivo oesteosintético que tiene una forma longitudinal basada en la forma de una hélice. El arte previo más cercano es EP-A-0094039 (D1), el cual define el preámbulo de la reivindicación 1.

El problema al que se dirige la invención es cómo suministrar un dispositivo osteosintético sustancialmente rígido que pueda ser insertado a través de una apertura relativamente pequeña en el hueso y que mejor corresponda a la anatomía de la cavidad medular dentro de la cual se inserta.

El problema se resuelve acomodando la ortogonal transversal con el eje central para tener una dimensión máxima en el rango entre 5 mm a 15 mm y que la hélice pase por encima de menos de 540° con un paso en el rango entre 100 mm y 1500 mm.

La invención involucra la selección especial de rangos de valores para parámetros que definen la hélice los cuales no son obvios para la persona versada en la materia. Por lo tanto, se considera que la reivindicación 1 es novedosa e inventiva. La aplicabilidad industrial de la invención se da por sí misma, así la reivindicación 1 satisface las condiciones del artículo 33(2)-(4) del PCT. Ya que las reivindicaciones 2 a 18 dependen de la reivindicación 1, las mismas igualmente satisfacen los requerimientos del PCT con relación a novedad, nivel inventivo e aplicación industrial.

El documento D1 no se citó en la descripción contrario a la Regla 5.1(a)(ii) del PCT.

La descripción no se ha alineado con las reivindicaciones como se requiere, de acuerdo con la Regla 5.1(a)(iii) del PCT.

1810/PCT
5.12.2002

REIVINDICACIONES

1. Un dispositivo osteosintético (1), en particular un clavo intramedular, que tiene una forma longitudinal con un eje central (5), una primera extremidad (2) y una segunda extremidad (3), donde la forma del dispositivo (1) está en la forma de hélice,
caracterizado porque
a) la ortogonal transversal al eje central (5) tiene una dimensión máxima en el rango de 5 a 14 mm;
b) la hélice se desarrolla en menos de 540°; y
c) el paso p de la hélice está en el rango de 100 a 1500 mm.

2. Dispositivo (1) de acuerdo con la reivindicación 1, caracterizado porque la hélice se desarrolla en menos de 360 grados.

3. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 2, caracterizado porque la sección transversal ortogonal con respecto al eje central (5) tiene una dimensión máxima en el intervalo de 7 a 11 mm.

4. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 3, caracterizado porque el paso p de la hélice se halla en el intervalo de 300 a 1.000 mm.

5. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 4, caracterizado porque el paso p de la hélice es mayor de 400 mm, preferiblemente mayor de 600 mm.

6. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 5, caracterizado porque la envolvente de la hélice es un cilindro circular (4) que tiene el mismo eje central (5) que la hélice.

7. Dispositivo (1) de acuerdo con la reivindicación 1 ó 6, caracterizado porque el radio r del cilindro circular (4) se halla en el intervalo de 10 a 50 mm, preferiblemente en el intervalo de 15 a 30 mm.

8. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 7, caracterizado porque una sección transversal (6) ortogonal al respecto al eje central (5) de la hélice, es un círculo.

9. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 7, caracterizado porque la sección transversal ortogonal con respecto el eje central (5) de la hélice, es un cuadrado o una estrella.

10. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 9, caracterizado porque la segunda extremidad (3) termina en una punta.

11. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 10, caracterizado porque una sección transversal (6) ortogonal con respecto al eje central (5) de la hélice es esencialmente un rectángulo con lados a y b, estando los lados más grandes b, orientados hacia el lado exterior e interior de la hélice.

12. Dispositivo (1) de acuerdo con la reivindicación 11, caracterizado porque la relación a:b es menor de 0,50, preferiblemente menor de 0,35.

13. Dispositivo (1) de acuerdo con la reivindicación 11 o 12, caracterizado porque la sección transversal esencialmente rectangular está recortada en sus lados menores a.

14. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 13, caracterizado porque la porción de la hélice más cercana a la primera extremidad (2) es más gruesa que la porción de la hélice más cercana a la segunda extremidad (3).

15. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 14, caracterizado porque el eje central (5) de la hélice es una línea recta.

16. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 15, caracterizado porque la longitud del cilindro o de la hélice se halla en el intervalo de 200 a 500 mm, preferiblemente en el intervalo de 250 a 400 mm.

17. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 16, caracterizado porque está provisto con orificios pasantes (7) para tornillos de bloqueo, preferiblemente cercanos a la segunda extremidad (3).

18. Dispositivo (1) de acuerdo con una cualquiera de las reivindicaciones 1 a 17, caracterizado porque está provisto con por lo menos dos, preferiblemente con por lo menos tres, orificios pasantes (7) para tornillos de bloqueo.

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FORMATO DE DIGITALIZACION
RELACION DE ANEXOS

Royal Technologies S.A.

Item	Expediente No	03-96821 No de unidades	No de Folio
1	CD		
2	DVD		
3	REVISTA		
4	LIBRO		
5	PERIODICO		
6	DISQUETES		
7	SOBRE DE MANILA	1	✓
8	SOBRE BLANCO TAMAÑO CARTA		
9	SOBRE BLANCO TAMAÑO OFICIO		
10	OTROS:		

Observaciones:
sobre contiene arte final

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SUPERINDUSTRIA Y COMERCIO
Radicacion : 03096821 00000000 Folios: 69
Fecha (AMD): 2003-10-30 17:22:39
Tramite : 011 PCT-PATENT 379 FASE NACI 411 PRESENTAC
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 03 - 75,150
FECHA : OCTUBRE 15 DE 2003

***** C O N S I G N A C I O N *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PASO	FECHA PGO	Vr. PASO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	15534393	15/10/2003	20,461,000.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	400,000.00
		TOTAL : $	400,000.00

SON: CUATROCIENTOS MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No._____

Cob 3261-841-006-5

Radicacion : 03096A01 00000000
Fecha (AMD): 2003-10-30 17:22:39 Folios: 69
Tramite : 011 PCT-PATENT 379 FASE NACI 411 PRESENTAC
Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL TRAMITE

	USUARIO	RADICADO
PATENTE DE INVENCIÓN MODELO DE UTILIDAD :	( )	( )
- Indicación de que se solicita la concesión de una patente.		( )
- Datos de identificación del solicitante o de la persona que se presenta la solicitud.		( )
- Descripción de la invención.		( )
- Dibujos de ser estos pertinentes.		( )
- Comprobante de Pago de las tasas establecidas.		
COMPLETA ( ) INCOMPLETA	( )	( )
DISEÑO INDUSTRIAL ( )		
- Indicación de que se solicita el registro de Diseño Industrial	( )	( )
- Datos de identificación del solicitante o de la persona que presenta	( )	( )
- la solicitud.		
- Representación gráfica y fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	( )	( )
Comprobante de pago de las tasas establecidas	( )	( )
COMPLETA ( ) INCOMPLETA	( )	( )
ESQUEMA DE TRAZADO ( )		
- Indicación de que solicita el registro de un Esquema de trazado.	( )	( )
- Datos de identificación del solicitante o de la persona que presenta La solicitud.	( )	( )
Representación gràfica del esquema de trazado	( )	( )
Comprobante de pago de las tasas establecidas.	( )	( )
COMPLETA ( ) INCOMPLETA	( )	( )

Firma Responsable:

Fecha:

Industria y Comercio
SUPERINTENDENCIA

23
71

Oficio

2020
Bogotá, D.C.,

Doctor:
Emilio Ferrero
Apoderado
Synthes AG Chur

Oficio N° 10660

ASUNTO:

Radicación N°	03-96821
Solicitud Internacional	PCT/CH2001/00276
Fecha inicio fase nacional	03/12/2003
Trámite	011
Evento	379
Actuación	430
Folios	001

Como resultado del examen de forma, realizado con fundamento el el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

☐ La solicitud no contiene la copia del documento en que consta la cesión del derecho a la patente dell inventor al solicitante o a su causante. (Art. 26-k)Decisión 486).

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.

ALIX CARMENZA CESPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista de fecha, 05 DIC. 2003.

202053