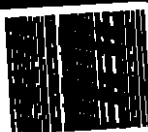


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ENTRADA EN FASE NACIONAL**

1

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Patente de Invención.



Patente de Modelo de Utilidad.



Capítulo I.



Capítulo II.

2

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5

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Título (54) UN DISPOSITIVO DE FIJACION QUIRURGICO

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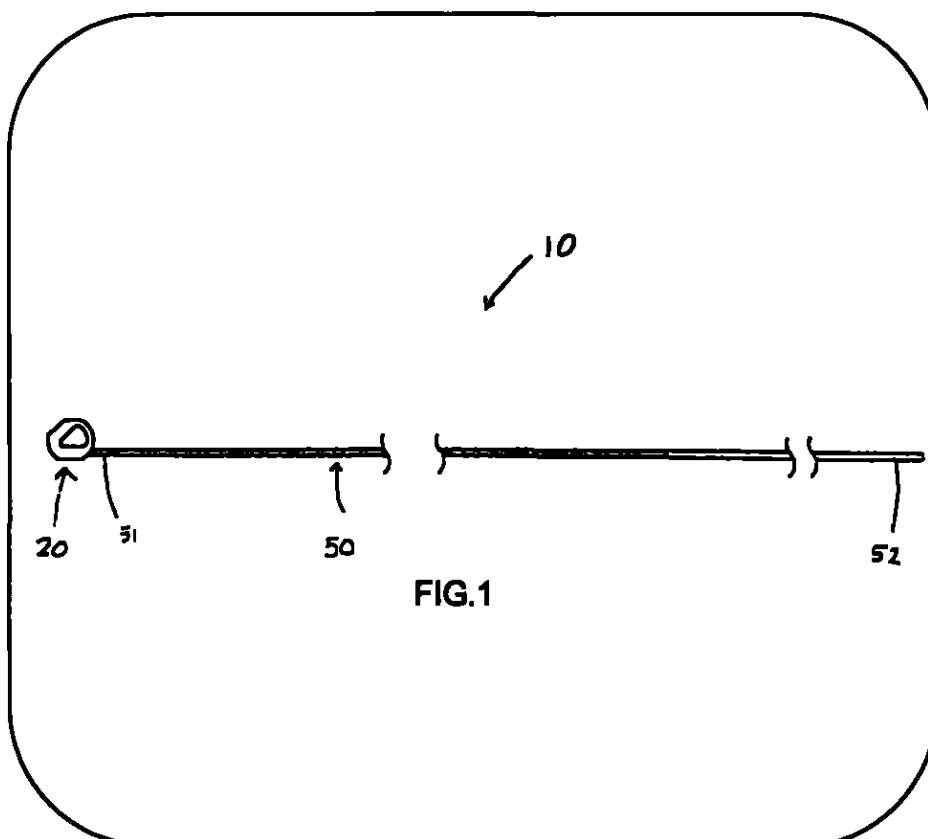
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Anexos:

- ☒ Comprobante de pago de la tasa de presentación de la solicitud por \$ 378.000.00.
- ☐ Comprobante de pago por reivindicación de prioridad.
- ☒ Documento que acredita la existencia y representación legal cuando el solicitante sea persona jurídica.
- ☒ Poderes, si fuere el caso.
- ☐ Documento de cesión del inventor al solicitante o a su causante.
- ☐ Declaraciones.
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☐ Copia del examen preliminar efectuado por la IPEA.
- ☐ Traducción del examen preliminar efectuado por la IPEA.
- ☐ De ser el caso, copia del contrato de accaso.
- ☐ 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.
- ☒ 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:



12

Solicito la concesión de la patente,

NOMBRE: EMILIO FERRERO

FIRMA:



C.C. 438.019 de Usaquén T.P. 31.929

JBP/mrm-ld-42-

UN DISPOSITIVO DE FIJACION QUIRURGICO

La presente invención esta dirigida a un instrumento ortopédico en general, y en particular a un dispositivo de sujeción o fijación por apriete de acuerdo con la definición de la reivindicación 1, para ser usado con cables quirúrgicos en la fijación de huesos durante operaciones quirúrgicas de huesos fracturados o la reconstrucción de huesos.

Durante las técnicas operativas quirúrgicas y ortopédicas, frecuentemente es necesario fijar partes de huesos, que han sido separadas quirúrgicamente o por fracturas, en una posición mútua exacta y unir las partes entre sí bajo presión. Con este fin se usan muchas veces conjuntos de un cable quirúrgico y una traba a presión. Los cables son usados para envolver el hueso, o el hueso y una placa, para proveer la fijación. En la fijación por cable, es usual usar un dispositivo de fijación, típicamente un dispositivo de traba, que está adaptado para ser deformado sobre el cable para asegurar el cable en su lugar, de modo que el cable envuelve el hueso en el área de la fractura. Tales conjuntos pueden estar sometidos a fuerzas de tensión muy elevadas cuando, por ejemplo, el hueso fracturado está sometido a un elevado momento de flexión. Por lo tanto, es importante que el conjunto de cable y traba tenga suficiente resistencia para prevenir la falla del cable bajo fuerza de tensión.

Típicamente, el cable debe ser usado en un área subcutánea restringida. Por lo tanto, es importante que el conjunto de cable y traba pueda ser montado fácilmente en un área tan restringida. Por ejemplo, es deseable tener un dispositivo que permita pasar el cable fácilmente a través del elemento de traba para prevenir un retorcimiento y posible deshilachamiento del cable al ser introducido en el elemento de traba. También es ventajoso tener acceso fácil al dispositivo de traba para facilitar la sujeción por presión. También es deseable un fácil acceso al cable para proveer espacio para la aplicación de una herramienta de tensado para ajustar el cable alrededor del hueso. Además, es deseable mantener la mayor parte del cable y de la unión en la cual el cable es fijado a sí mismo tan compactos como sea posible para minimizar las molestias para el paciente y el daño al tejido circundante.

El arte conoce una amplia variedad de dispositivos para fijar por apriete un alambre quirúrgico. Ejemplos de tales dispositivos de traba incluyen aquéllos descritos en la Patente U.S. No. 5.810.625 concedida a Huebner y las Patentes Nos. 5.868.748 y 5. 720.747 concedidas a Burke. Si bien estos dispositivos son muy exitosos desde un punto de vista técnico para lograr la fijación por apriete del alambre quirúrgico, la mayoría de los dispositivos existentes tienen limitaciones prácticas. Por ejemplo, la mayoría de los dispositivos de

fijación por apriete mantienen el alambre o cable quirúrgico en posición paralela a sí mismo en el elemento de fijación o de traba, lo que hace difícil acceder al extremo libre del cable y ajustarlo alrededor del hueso. Además, algunos dispositivos de fijación por apriete requieren que todo el elemento de fijación o de traba sea deformado por aplastamiento para fijar el alambre quirúrgico al mismo, lo que requiere un mayor área de acceso para permitir a la herramienta de aplastamiento acceder a todo el elemento de fijación o de traba.

Existen otros dispositivos de traba que tienen una forma substancialmente en "L" y que mantienen el alambre o cable quirúrgico a un ángulo de 90° con respecto a sí mismo al salir del elemento de fijación o de traba. Mantener el cable a un ángulo tan empinado puede producir un doblez en el cable en este lugar y aumentar la probabilidad de una rotura del cable. Además, si el elemento de traba mantiene el cable a un ángulo de 90°, es más difícil insertar el cable a través del elemento de traba.

Existe, por lo tanto, una necesidad de un dispositivo de fijación quirúrgico que sea compacto, suficientemente resistente, y de fácil montaje en un área restringida.

La presente invención está dirigida a un dispositivo de fijación quirúrgico para fijar elementos de huesos, dispositivo que comprende un cable flexible que tiene un

primer extremo y un segundo extremo unidos a un elemento de traba. El elemento de traba tiene una primera porción y una segunda porción que se extienden entre extremos anterior y posterior. Las porciones primera y segunda están a la mayor distancia entre sí en el extremo posterior para formar un cuerpo de forma de cuña. Además, a través de la segunda porción se extiende un conducto. El primer extremo del cable está fijado firmemente a la primera porción en el extremo posterior, y el segundo extremo del cable puede ser insertado a través del conducto de la segunda porción para formar un bucle de diámetro ajustable.

En una realización, los extremos anterior y posterior del elemento de traba están redondeados y el extremo anterior del elemento de traba puede tener un radio de curvatura menor que el extremo posterior.

En otra realización, el extremo anterior del elemento de traba es sólido y el extremo posterior tiene una ranura longitudinal.

En aún otra realización, el elemento de traba tiene una porción central abierta que forma un recorte substancialmente triangular.

En una realización alternativa, el segundo extremo del cable tiene una guía para facilitar el manejo.

En una realización adicional, el cable es de varios hilos.

En otra realización, las porciones primera y segunda del elemento de traba son coplanares.

La presente invención está dirigida además a un dispositivo de fijación quirúrgico para sujetar a presión un cable quirúrgico. El dispositivo incluye un elemento de traba que comprende un cuerpo en forma de cuña que tiene una primera superficie principal y una segunda superficie principal, paralelas entre sí e interconectadas verticalmente por un borde periférico. El cuerpo tiene una abertura triangular dispuesta centralmente que se extiende verticalmente a través del mismo desde la primer superficie principal hasta la segunda superficie principal. El cuerpo también tiene un par de conductos que se extienden longitudinalmente a través del mismo. Los conductos están dispuestos entre sí en un ángulo no paralelo.

En una realización alternativa, el dispositivo incluye además un cable flexible fijado a uno de los conductos del elemento de traba. El cable tiene un primer extremo y un segundo extremo, y un extremo está unido firmemente a un conducto del elemento de traba y el otro extremo puede ser insertado a través del otro conducto, para formar un bucle de diámetro ajustable. El cable puede ser de varios hilos y el extremo insertable puede tener una guía para facilitar el manejo.

La presente invención también está dirigida a un

dispositivo de fijación quirúrgico que comprende un cable que tiene un extremo libre y un extremo fijo unido a un elemento de traba. El elemento de traba tiene una primera pata con extremos primero y segundo. El primer extremo tiene un agujero ciego para recibir el extremo fijo del cable. El elemento de traba también tiene una segunda pata con extremos primero y segundo. La segunda pata tiene una perforación pasante que se extiende desde el primer extremo hasta el segundo extremo de la segunda pata. El elemento de traba también tiene una porción de puente delantero que conecta el segundo extremo de la primera pata al segundo extremo de la segunda pata. El elemento de traba también tiene una porción de puente posterior que conecta el primer extremo de la primera pata al primer extremo de la segunda pata. La porción de puente posterior es más larga que la porción de puente anterior, de modo que el elemento de traba tiene una forma de cuña. La segunda pata es deformable por aplastamiento de modo que el cable es fijado por aplastamiento al elemento de traba después de que el extremo libre es insertado en la perforación pasante.

En otra realización, el cable tiene varios hilos y el extremo libre tiene una guía para facilitar el manejo.

La Figura 1 es una vista en planta de un dispositivo de fijación quirúrgico de acuerdo con la presente invención que muestra un cable flexible y un elemento de traba;

La Figura 2 es una vista en perspectiva del elemento de traba de la Figura 1 antes de haber sido unido con el cable;

La Figura 3 es una vista en planta del elemento de traba de la Figura 2 con una parte cortada para mostrar secciones transversales de los conductos internos del elemento;

La Figura 4 es una vista de frente del elemento de traba de la Figura 2;

La Figura 5 es una vista de atrás del elemento de traba de la Figura 2;

La Figura 6 es una vista aumentada de la Figura 1 con un aumento del primer extremo del cable;

La Figura 7 es una vista lateral del dispositivo de fijación quirúrgico de la Figura 1 después de que el dispositivo ha sido fijado a presión alrededor de un hueso;

La Figura 8 es una vista lateral del dispositivo de fijación del cable quirúrgico de la Figura 7 que muestra el elemento de traba en posición de bajo perfil;

La Figura 9 es una vista en planta del dispositivo de fijación quirúrgico de la Figura 8;

La Figura 10 es una vista lateral del elemento de traba de la Figura 2;

La Figura 11 es una vista en planta de una realización alternativa del dispositivo de fijación quirúrgico;

La Figura 12 es una vista en perspectiva de una realización alternativa del elemento de traba;

La Figura 13 es una vista en planta del elemento de traba de la Figura 12 con una parte cortada que muestra secciones transversales de los conductos internos del elemento; y

La Figura 14 es una vista en perspectiva del elemento de traba de la figura 12 que muestra un cable que se extiende a través del elemento.

Como muestra la Figura 1, un dispositivo de fijación quirúrgico 10 de acuerdo con la presente invención incluye un elemento de traba 20 y un cable flexible 50. El cable 50 puede ser un cable de un solo hilo o un cable formado por múltiples hilos. Un primer extremo 51 del cable está unido firmemente al elemento de traba 20 y un segundo extremo 52 del cable es un extremo libre.

Como se puede observar mejor en las Figuras 2 - 5, el elemento de traba 20 tiene preferentemente la forma de cuña con un perímetro generalmente triangular. Para facilitar el manejo, los ángulos están redondeados o alisados en vez de ser puntiagudos. El elemento de traba tiene preferentemente una superficie superior plana 31, una superficie inferior plana 32 paralela a la superficie superior y una superficie perimetral 30 que se extiende verticalmente entre las superficies mencionadas previamente. La superficie perimetral 30 tiene dos secciones de pared lateral 33 y 34, una sección de pared anterior 35 y una sección de pared posterior 36. Las

secciones de pared lateral 33 y 34 están desplazadas entre sí en un ángulo no paralelo. Preferentemente, las secciones de pared lateral 33 y 34 forman entre sí un ángulo agudo. Las secciones de pared lateral 33 y 34 están conectadas por una sección de pared anterior 35 en el extremo anterior o vértice. En el extremo posterior o base, las dos secciones de pared lateral están conectadas por medio de una sección de pared posterior 36 redondeada. La sección de pared posterior redondeada tiene preferentemente un radio de curvatura mayor que la sección de pared anterior 35.

El elemento de traba 20 tiene preferentemente un recorte vertical 24. En la realización preferida, el recorte vertical 24 es generalmente triangular. Preferentemente, la superficie perimetral 45 del recorte es similar a la superficie perimetral 30 del elemento de traba, de modo que el recorte 24 tiene secciones laterales 37 y 38 que están paralelas a las secciones de pared lateral perimétricas 33 y 34, respectivamente. Las secciones laterales del recorte están conectadas en el extremo anterior o vértice por una sección anterior 39 redondeada y en el extremo posterior o base por una sección posterior 40 redondeada. La sección posterior redondeada 40 del recorte tiene preferentemente un radio de curvatura mayor que la sección anterior 39.

En la realización mostrada en las Figuras 2 - 5, la sección lateral 37 del recorte y la sección de pared lateral

perimétrica 33 definen conjuntamente una primera pata 25. La sección lateral 38 del recorte y la sección de pared lateral perimétrica 34 definen conjuntamente una segunda pata 26. La sección delantera 39 del recorte y la sección de pared frontal perimétrica 35 definen conjuntamente una sección de nariz 41. La sección posterior 40 del recorte y la sección de pared posterior perimétrica 36 definen conjuntamente una sección de puente 42. La sección de nariz 41 en el extremo anterior es preferentemente sólida y la sección de puente 42 en el extremo posterior tiene preferentemente una ranura longitudinal 23 que se extiende a través de dicha sección. De este modo el elemento de traba 20 tiene una primera pata 25 y una segunda pata 26 que están unidas en el extremo anterior por la sección de nariz 41 y que se extienden longitudinalmente desde el extremo anterior del elemento de traba 20 hasta el extremo posterior o base, formando un ángulo no paralelo, preferentemente agudo. Las patas primera y segunda, 25 y 26, presentan la distancia mayor entre sí en el extremo posterior. Las patas primera y segunda, 25 y 26, están conectadas horizontalmente en el extremo posterior por la sección de puente 42.

La primera pata 25 tiene un conducto ciego interno 27 que se extiende longitudinalmente en la misma para recibir el primer extremo 51 del cable 50. El conducto 27 tiene preferentemente una abertura situada en la sección de pared

posterior perimétrica 36 colocada en el extremo posterior del elemento de traba 20. Preferentemente el conducto ciego 27 es cilíndrico con un eje central que se extiende longitudinalmente, en paralelo con la sección de pared posterior perimétrica 33 y la sección lateral 37 del recorte. La segunda pata 26 tiene un conducto pasante 29 para recibir el segundo extremo 52 del cable 50, que se extiende longitudinalmente a través de toda la segunda pata. El conducto pasante 29 tiene una abertura anterior 21 en la sección de pared anterior perimétrica 35 y una abertura posterior 22 en la porción de pared posterior perimétrica 36. Preferentemente, el conducto pasante 29 es cilíndrico con un eje central que se extiende longitudinalmente dispuesto paralelamente a la sección de pared lateral perimétrica 34 y la sección lateral 38 del recorte vertical 24. En la Figura 3, porciones del elemento de traba 20 han sido cortadas para mostrar los conductos internos 27 y 29 de la primera pata 25 y la segunda pata 26, respectivamente. Los ejes centrales de estos canales que se extienden longitudinalmente son coplanares. Las patas primera y segunda, 25 y 26, tienen un espesor ligeramente mayor que el diámetro del cable 50 para permitir que el cable 50 sea insertado en los mismos.

Haciendo referencia a la Figura 6, el primer extremo 51 del cable 50 está unido firmemente al elemento de traba 20. Puede usarse cualquier medio adecuado para fijar el primer

extremo 51 del cable 50 al elemento de traba 20, tal como pegado, soldado, estampado, etc. Preferentemente, el primer extremo 51 del cable 50 es insertado en el conducto ciego 27 de la primera pata 25, y el cable 50 es estampado al conducto para fijar el primer extremo 51 del cable 50 permanentemente al elemento de traba 20. El segundo extremo 52 del cable 50 tiene una porción guía 53 soldada al mismo para facilitar el manejo del cable 50 y la introducción del segundo extremo 52 a través del conducto 29 de la segunda pata 26 durante la operación.

Para usar el dispositivo de fijación quirúrgico con el fin de fijar un cable alrededor de un hueso, el cirujano primero prepara el área exponiendo el hueso del paciente. Haciendo referencia a las Figuras 7 - 9, el elemento de traba es colocado contra un hueso 60 a ser reparado, y el segundo extremo 52 del cable es enrollado alrededor del hueso 60. Luego el segundo extremo 52 del cable 50 es insertado a través del conducto 29 del elemento de traba 20. El cable entra preferentemente en el conducto 29 a través de la abertura anterior 21 y sale del conducto 29 a través de la abertura posterior 22. Sin embargo, el cable puede ser insertado a través del conducto 29 de un modo inverso. Inicialmente, la sección de pared lateral 33 es colocada preferentemente tangencialmente al hueso 60, de modo que el elemento de traba 20 se apoya sobre la primera pata 25 y la

segunda pata 26 se aleja del hueso 60 en forma angular. Si el cable 50 es insertado a través del conducto 29 y el segundo extremo 52 sale por la abertura posterior 22, el segundo extremo 52 se aleja del hueso 60 y mira hacia el cirujano. Permitir que el cable forme un ángulo con el hueso al alejarse del mismo es particularmente ventajoso, debido a que es más fácil acceder al segundo extremo 52 con una herramienta de tensado. Luego se tira del extremo 52 del cable 50 para llevar el mismo a una posición ajustada alrededor del hueso 60 con ayuda de una herramienta de tensado convencional que no se muestra en los dibujos. Una vez lograda la tensión deseada, la segunda pata 26 es aplastada con una pinza o un instrumento para aplastar similar conocido en el arte. Es particularmente ventajoso que la segunda pata 26 se aleje del hueso 60 en forma angular para permitir un mayor acceso de un instrumento para aplastar la pata de la traba en un área restringida. Además, debido a que sólo se aplasta una porción del elemento de traba 20, aquí la segunda pata 26, se requiere menos fuerza que para aplastar todo el elemento de traba. Al ser aplastada la segunda pata 26, el canal pasante 29 es deformado o estrechado, previniendo el movimiento del cable 50 a través del mismo para fijar el cable en el conducto 29 bajo tensión. Luego, un exceso de cable que se extiende más allá del extremo posterior puede ser cortado y retirado.

Como muestran las Figuras 8 y 9, el elemento de traba 20 puede ser dado vuelta para asentarse en forma plana después del aplastamiento de la segunda pata 26, colocando la superficie plana superior 31 o la superficie plana inferior 32 en contacto con el hueso 60. Como resultado, se reduce el perfil del dispositivo de traba en el cuerpo. Por ejemplo, después de aplastar las patas 25 y 26 y dar vuelta al elemento de traba 20 para colocarlo en forma plana, el espesor resultante del elemento de traba 20 es preferentemente no substancialmente mayor que el radio del cable 50.

Si bien el cable 50 está representado como un alambre de varios hilos, la invención puede ser usada con cualquier tipo de cable quirúrgico, tal como un alambre de un solo hilo. Preferentemente, el cable usado con la traba propuesta es un cable formado por múltiples hilos. El elemento de traba 20 y el cable 50 son preferentemente de titanio, si bien pueden ser fabricados a partir de cualquier material adecuado para procedimientos quirúrgicos.

Con referencia a la Figura 10, preferentemente una flecha, un símbolo u otro indicio es grabado sobre el lado exterior de la segunda pata para ilustrar la dirección de inserción preferida del segundo extremo 52 del cable 50 a través del conducto 29.

Con referencia a la Figura 11, otra realización de la

presente invención incluye un cable 80 que tiene unido en cada extremo un elemento de traba como previamente descrito. Una porción guía 81 es soldada sobre el cable en el centro longitudinal del mismo. Al ser cortado el cable 80 en el centro de la porción guía 81, se obtienen dos dispositivos de fijación idénticos de acuerdo con la presente invención. Esta realización de la presente invención provee una fabricación y un almacenamiento eficientes de los dispositivos de fijación.

Haciendo referencia a las Figuras 12 - 14, una realización alternativa del elemento de traba tiene dos elementos de pata, una primera pata 61 y una segunda pata 62, dispuestas en una configuración generalmente triangular y unidas en el extremo anterior o vértice. Los elementos de pata 61 y 62 están preferentemente desplazados entre sí en un ángulo no paralelo. Preferentemente, los elementos de pata 61 y 62 están desplazados entre sí en un ángulo agudo. Las patas 61 y 62 están conectadas horizontalmente por medio de una sección de unión 63. En esta realización, las patas 61 y 62 son substancialmente cilíndricas y comprenden conductos concéntricos dentro de las mismas. La primera pata 61 tiene un conducto concéntrico ciego 64 que se extiende longitudinalmente en la misma. El conducto ciego 64 tiene una abertura en el extremo posterior del elemento de traba. La segunda pata 62 tiene un canal pasante concéntrico 65 que se extiende a través de toda la longitud de la pata 62. El

conducto pasante 65 tiene una abertura en el extremo posterior y una abertura en el extremo anterior. Un chanfle cónico 66 circunda las aberturas de los conductos 64 y 65 para guiar la introducción del cable en los canales.

Mientras que es aparente que las realizaciones ilustrativas de la invención descritas en ésta cumplen los objetivos arriba establecidos, será apreciado que los entendidos en el arte pueden idear numerosas modificaciones y otras realizaciones. Por lo tanto, será entendido que las reivindicaciones anexas tienen la intención de cubrir todas las modificaciones y realizaciones tales que se encuentran dentro del alcance y espíritu de la presente invención.

REIVINDICACIONES

Habiendo descrito y determinado la naturaleza y el alcance de la presente invención y la manera que la misma ha de ser llevada a la práctica, se declara que lo que se reivindica como invención y de propiedad exclusiva, es:

1. Un dispositivo de fijación quirúrgico para fijar elementos de hueso, caracterizado por comprender:

un cable flexible (50;80) que tiene un primer extremo y un segundo extremo (51;52); y

un elemento de traba (20) que tiene una primera porción y una segunda porción y que se extiende entre extremos anterior y posterior, estando dichas porciones primera y segunda a la mayor distancia entre sí en el extremo posterior para conformar un cuerpo en forma de cuña, y teniendo dicha segunda porción un conducto que se extiende a través de la misma,

dispositivo en el cual el primer extremo del cable está fijado firmemente a dicha primera porción en el extremo posterior y el segundo extremo del cable puede ser insertado a través del conducto de la segunda porción para formar un bucle de diámetro ajustable.

2. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque los extremos anterior y posterior del elemento de traba están redondeados.

3. El dispositivo de acuerdo con la reivindicación 2,

caracterizado porque el extremo anterior del elemento de traba tiene un radio de curvatura menor que el extremo posterior.

4. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque el extremo anterior del elemento de traba es sólido y el extremo posterior tiene una ranura longitudinal.

5. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque el elemento de traba tiene una porción central abierta que forma un recorte substancialmente triangular.

6. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque el segundo extremo del cable tiene una guía para facilitar el manejo.

7. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque el cable tiene varios hilos.

8. El dispositivo de acuerdo con la reivindicación 1, caracterizado porque las porciones primera y segunda del elemento de traba son coplanares.

9. Un dispositivo de fijación quirúrgico para sujetar a presión un cable quirúrgico, estando dicho dispositivo caracterizado por incluir un elemento de traba que comprende un cuerpo en forma de cuña que tiene una primera superficie principal y una segunda superficie principal paralelas entre sí e interconectadas verticalmente por un borde periférico,

teniendo dicho cuerpo una abertura triangular dispuesta centralmente que se extiende a través de dicho cuerpo desde la primera superficie principal hasta la segunda superficie principal y un par de conductos que se extienden longitudinalmente a través de dicho cuerpo, estando dichos conductos dispuestos entre sí en un ángulo no paralelo.

10. El dispositivo de la reivindicación 9, caracterizado por comprender además un cable flexible que tiene un primer extremo y un segundo extremo, uno de los cuales está fijado firmemente a uno de los conductos del elemento de traba, y el otro puede ser insertado a través del otro conducto para formar un bucle de diámetro ajustable.

11. El dispositivo de la reivindicación 10, caracterizado porque el cable tiene varios hilos y el extremo insertable tiene una guía para facilitar el manejo.

12. Un dispositivo de fijación quirúrgico, carcterizado por comprender un cable que tiene un extremo libre y un extremo fijo, y un elemento de traba que comprende:

una primera pata con un primer extremo y un segundo extremo, teniendo el primer extremo una agujero ciego para recibir el extremo fijo del cable,

una segunda pata con un primer extremo y un segundo extremo y una perforación pasante que se extiende desde el primer extremo hasta el segundo extremo de la segunda pata,

una porción de puente anterior que tiene un radio de

curvatura y que conecta el segundo extremo de la primera pata al segundo extremo de la segunda pata, y

una porción de puente posterior que tiene un radio de curvatura y que conecta el primer extremo de la primera pata al primer extremo de la segunda pata, elemento de traba en el cual:

la porción de puente posterior es más larga que la porción de puente anterior, de modo que el elemento de traba tiene una forma de cuña y la segunda pata puede ser deformada por aplastamiento de modo que el cable es sujetado por el elemento de traba después de que el extremo libre ha sido insertado a través de la perforación pasante.

13. El dispositivo de la reivindicación 12, caracterizado porque el cable tiene varios hilos y el extremo libre tiene una guía para facilitar el manejo.

RESUMEN

Un dispositivo de fijación quirúrgico que incluye un cable con un extremo fijo y un extremo libre y un elemento de traba para asegurar el cable. El elemento de traba tiene una primera pata que tiene un agujero ciego para recibir el extremo fijo del cable, y una segunda pata con una perforación pasante que se extiende a través de la segunda pata para recibir el extremo libre del cable. Las patas primera y segunda están conectadas en la parte anterior por una porción de puente anterior y en la parte posterior por una porción de puente posterior. La porción de puente posterior es más larga que la porción de puente anterior, de modo que el elemento de traba tiene una forma de cuña, y la segunda pata es deformable por aplastamiento de modo que el cable es sujetado por aplastamiento al elemento de traba después de que el extremo libre ha sido insertado a través de la perforación.

10

1/14

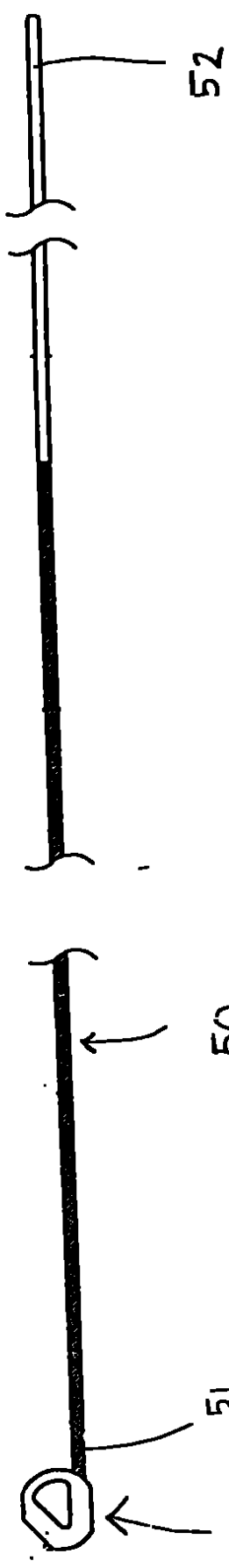
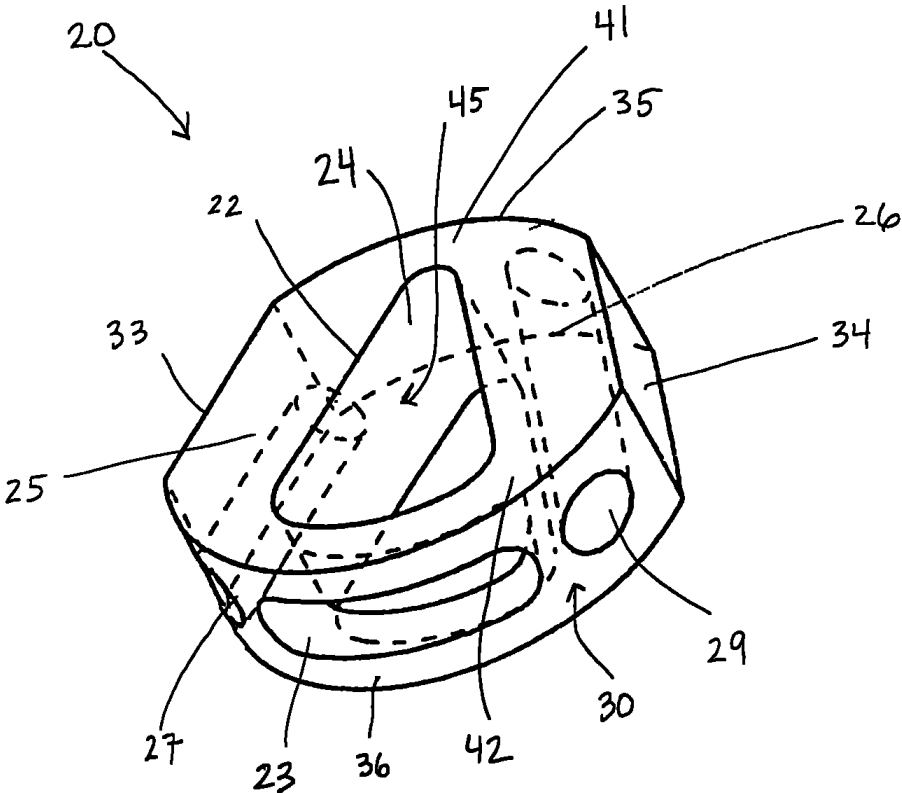


Fig. 1



2/14

Fig 2

26

3 / 14

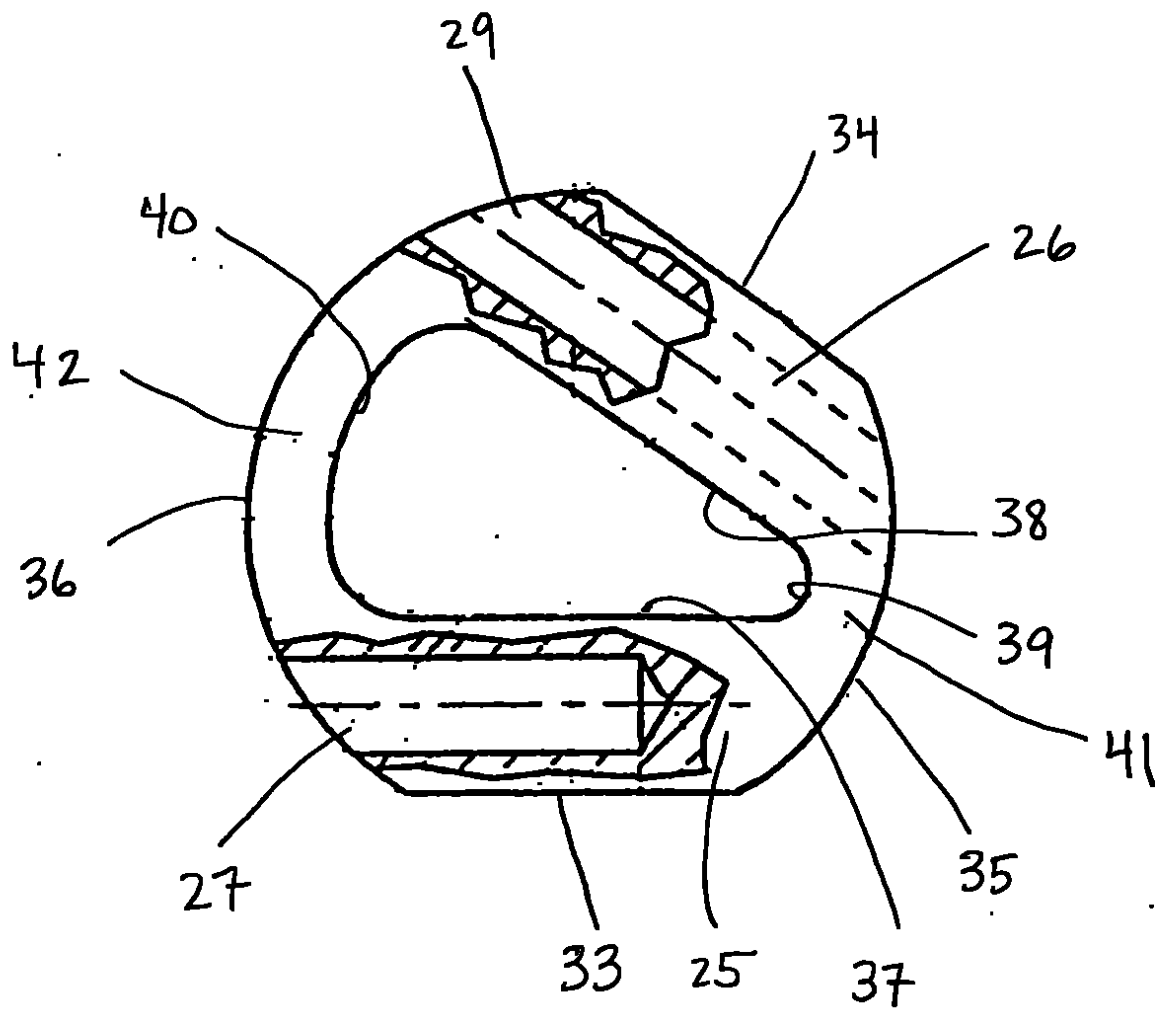


Fig. 3

4/14

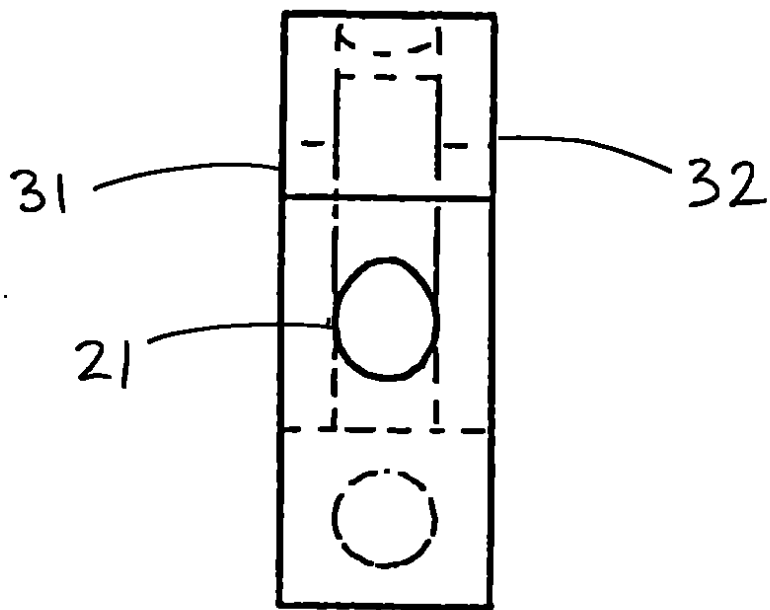


Fig. 4

5/14

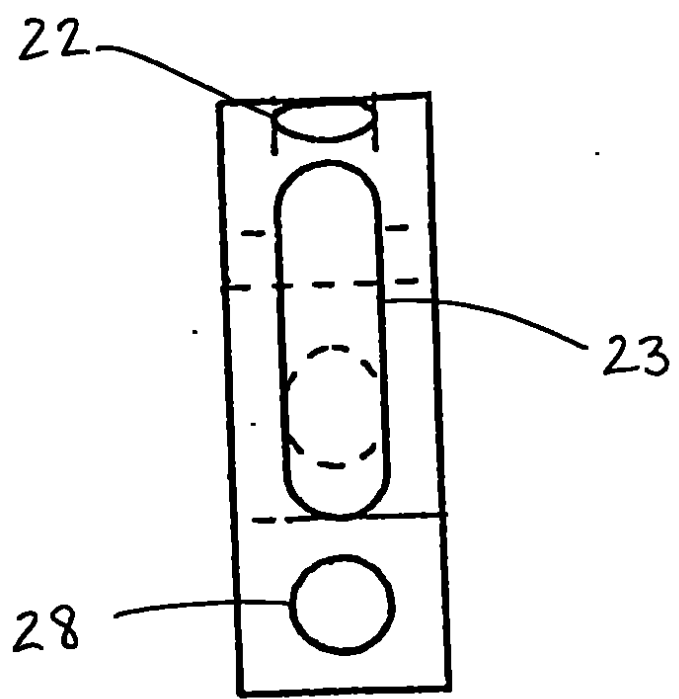


Fig. 5

6/14

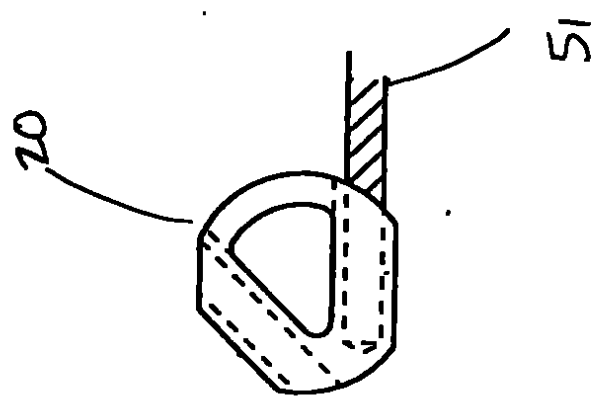


Fig. 6

7/14

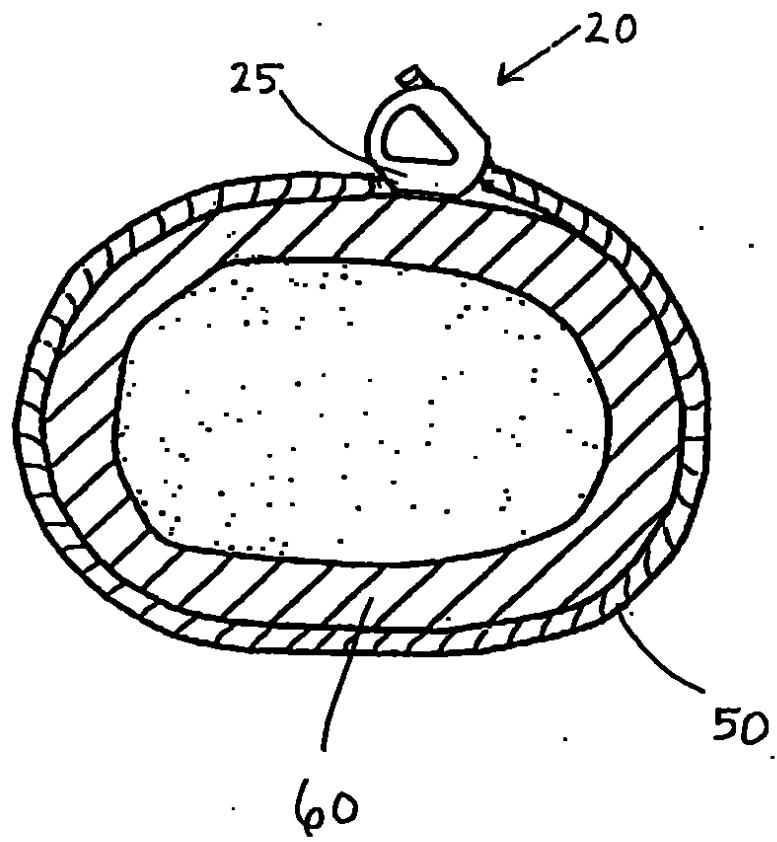


Fig. 7

8/14

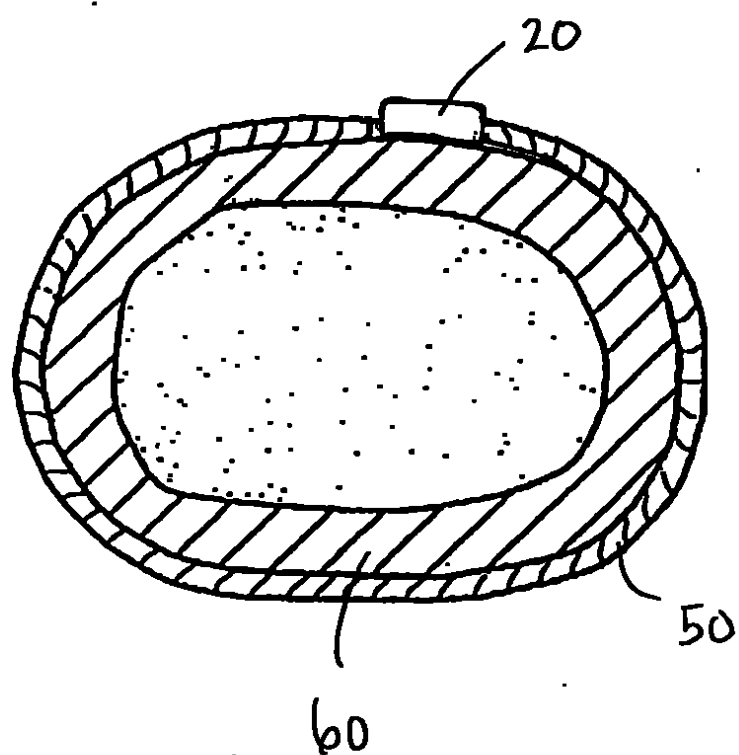


Fig. 8

9/14

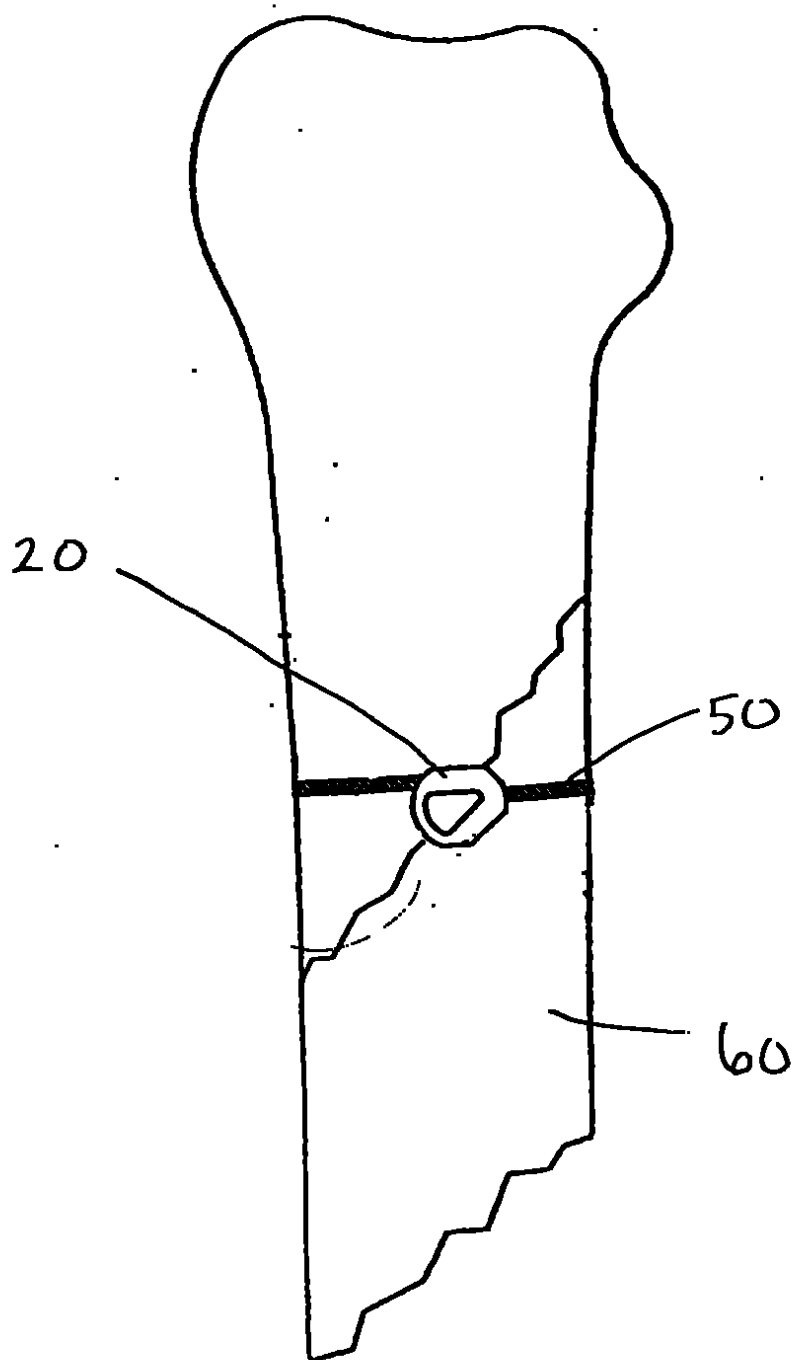


Fig. 9

10/14

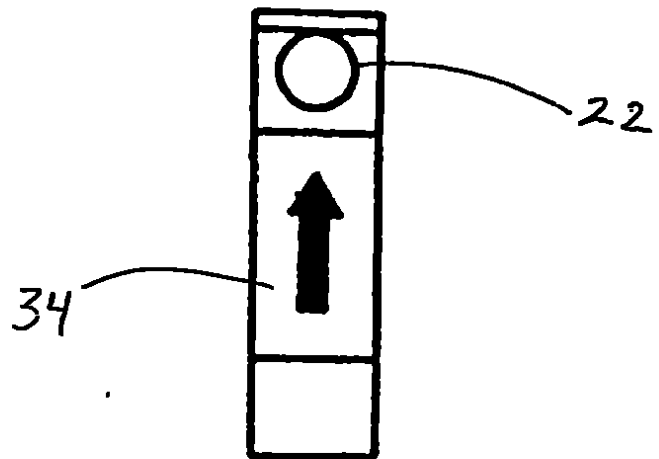


Fig. 10

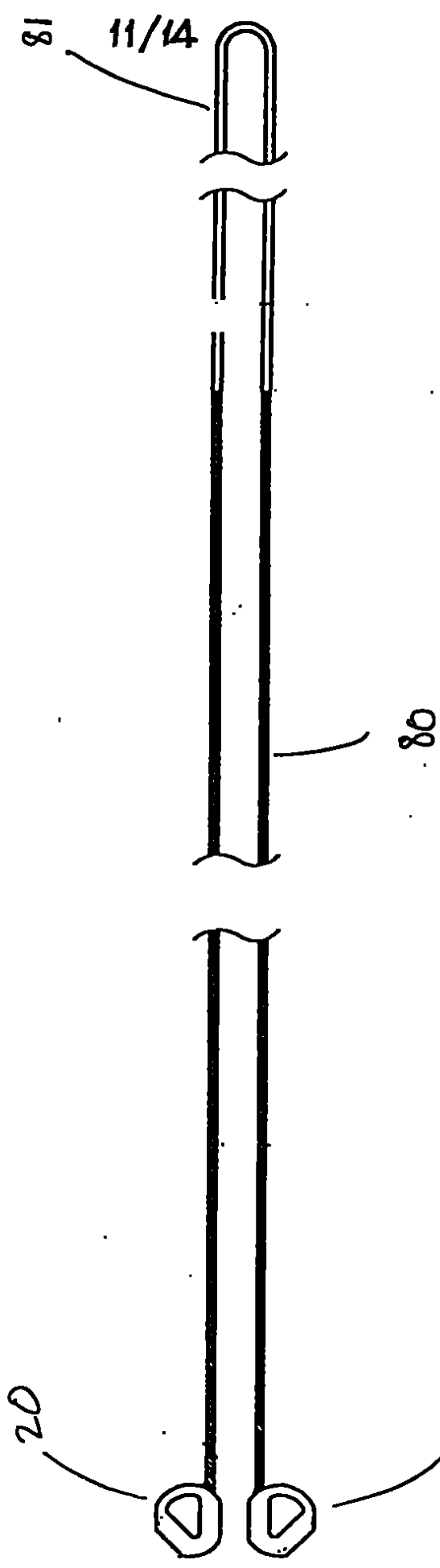


Fig. 11

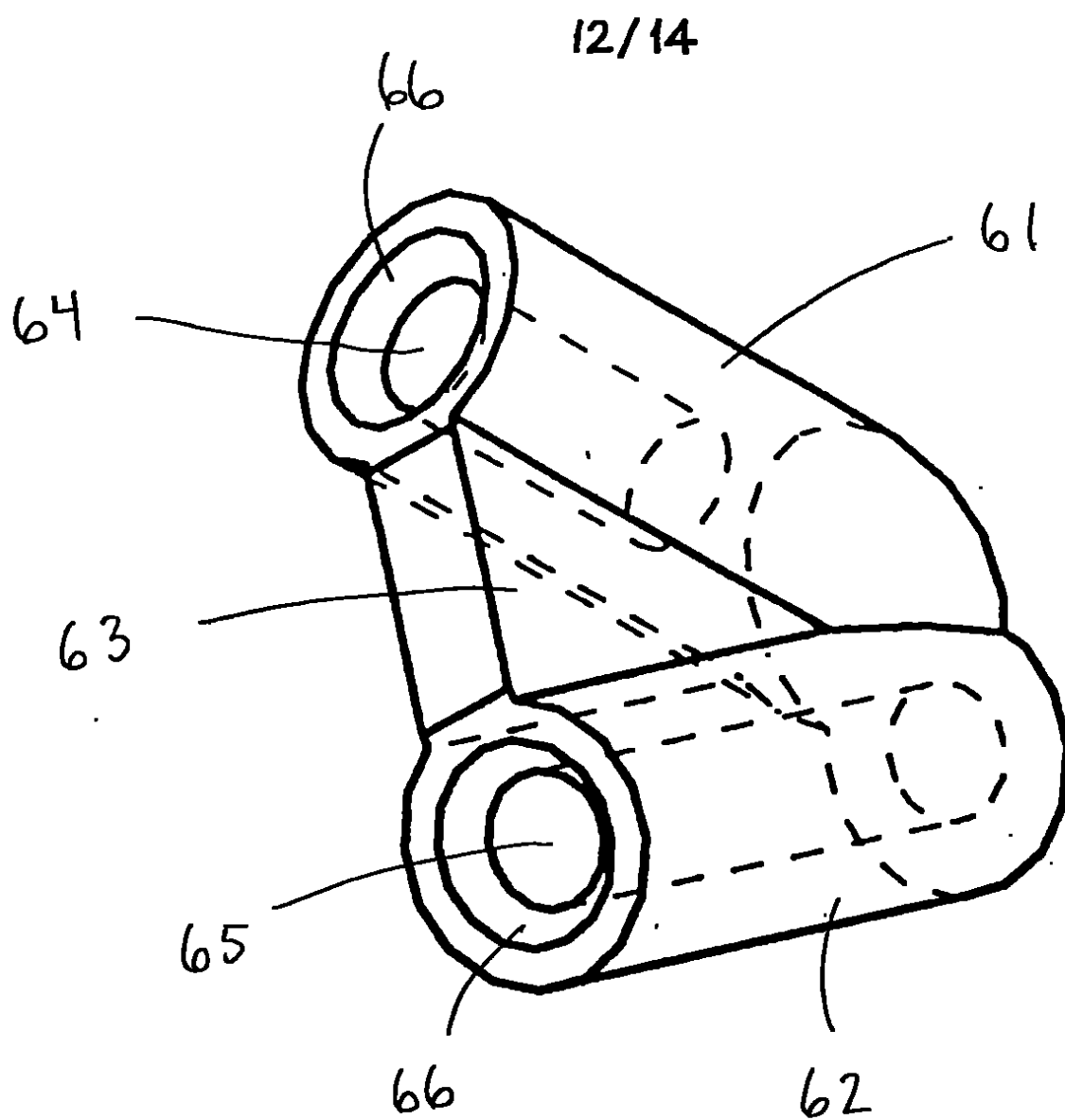


Fig. 12

13/14

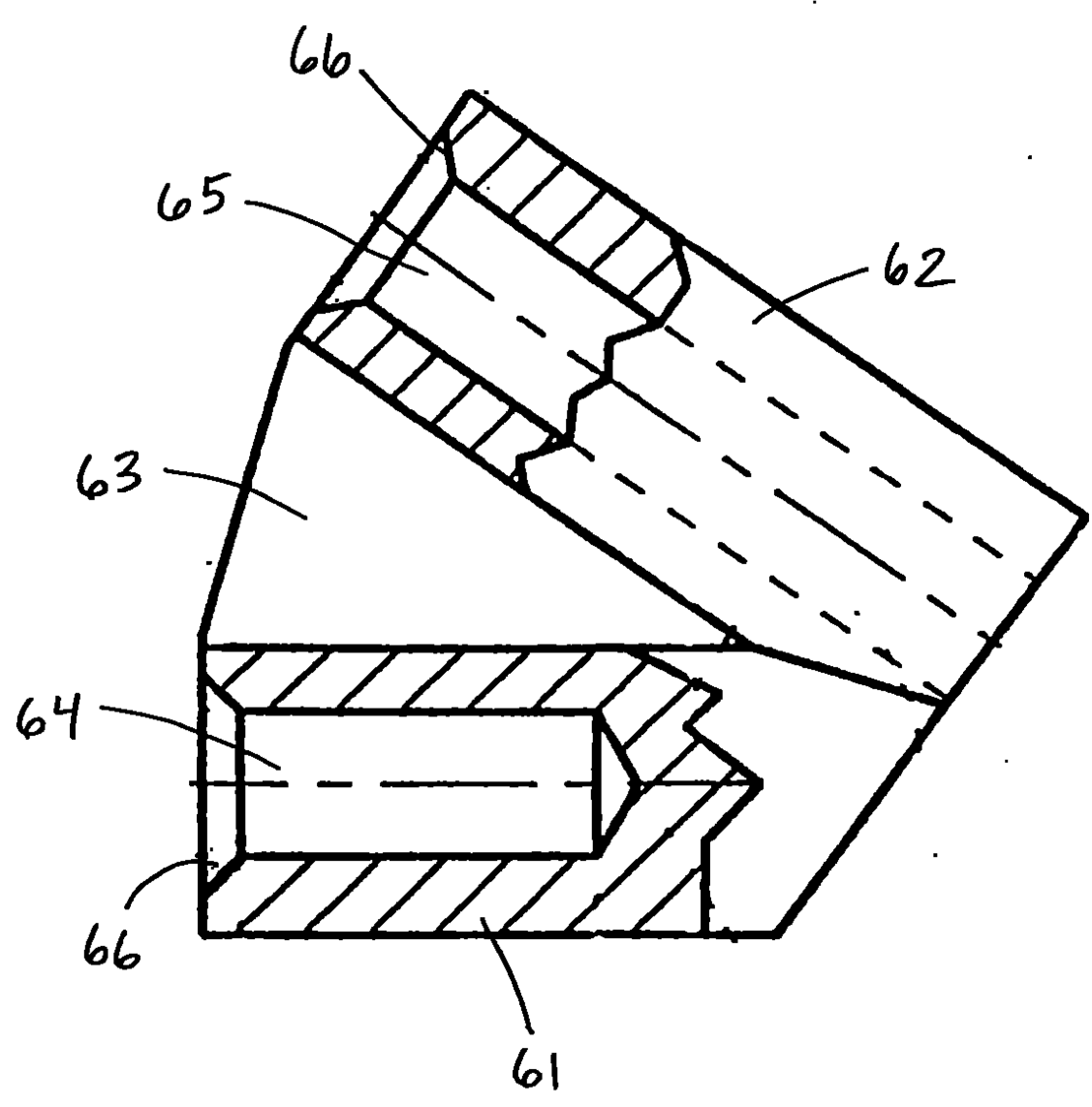


Fig. 13

14/14

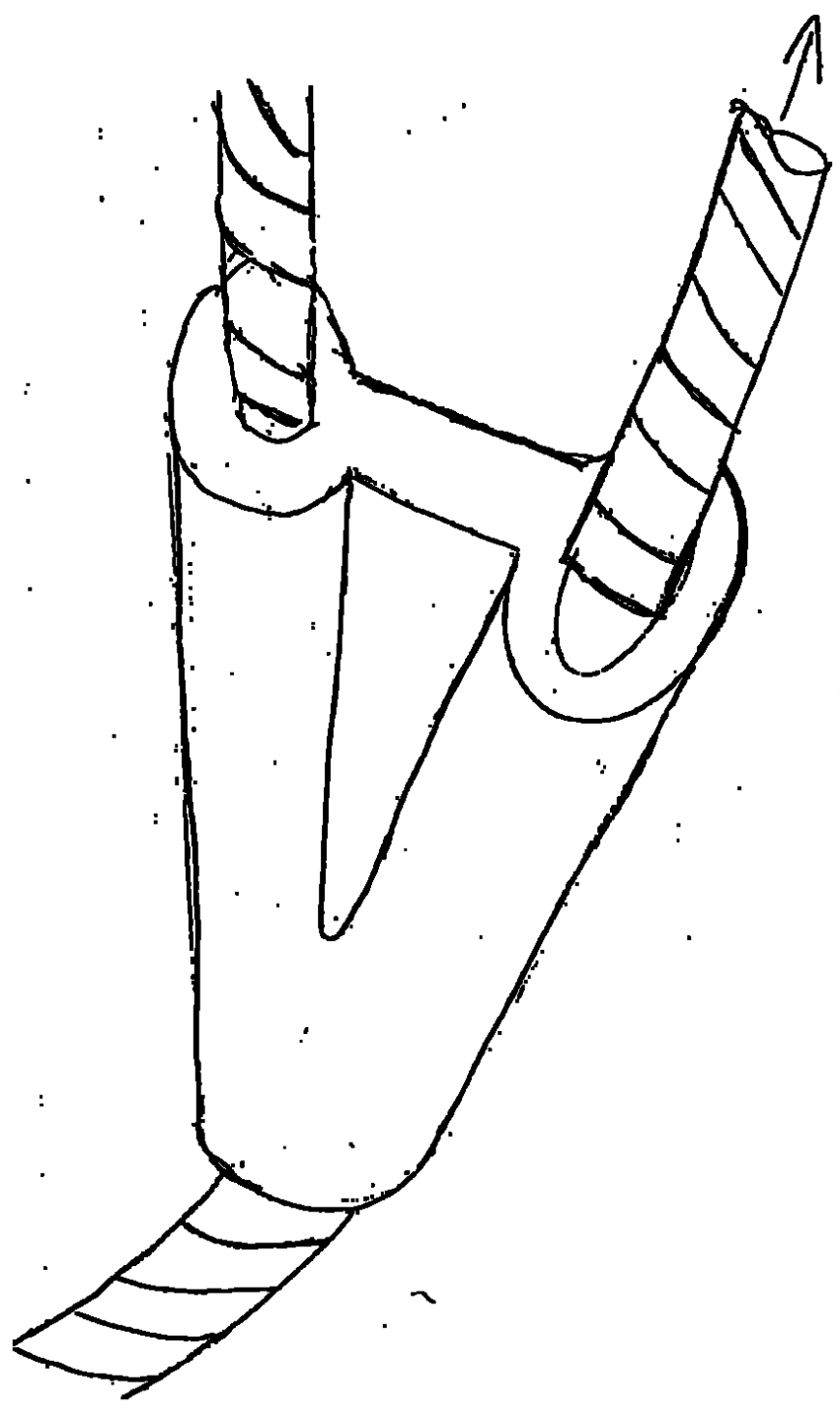


Fig. 14

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)			
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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			
Name and address: <i>(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.)</i> LINTELL-SMITH Michael Paul 305 E. Johnson Highway East Norriton, PA 19401 USA		This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i>	
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			
Name and address: <i>(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.)</i> 		This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i>	
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			
Name and address: <i>(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.)</i> 		This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i>	
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			
Name and address: <i>(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.)</i> 		This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i>	
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			
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.			

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Mark the applicable check-boxes below; at least one must be marked.

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Regional Patent

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- ☐ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
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- ☐ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | | |
|--|---|---|
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| ☐ AG Antigua and Barbuda | ☐ GM Gambia | ☐ MZ Mozambique |
| ☐ AL Albania | ☐ HR Croatia | ☐ NO Norway |
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| ☐ GE Georgia | | |

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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.)

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 - (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;*
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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 18301-1222
USA

See Notes to the request form

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10. ☐	other (specify):	:																																																			
Figure of the drawings which should accompany the abstract: 1	Language of filing of the international application: German																																																				

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. Kalser March 8, 2001

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PCT

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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)

27 September 2001 (27.09.01)

Applicant's or agent's file reference

1799/PCT

IMPORTANT NOTICE

International application No.

PCT/CH01/00152

International filing date (day/month/year)

09 March 2001 (09.03.01)

Priority date (day/month/year)

24 March 2000 (24.03.00)

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:

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:

BR, CA, CO, EP, JP, MX

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 27 September 2001 (27.09.01) under No. WO 01/70122.

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that 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.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

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

Facsimile No. (41-22) 740.14.35

Authorized officer

J. Zahra

Telephone No. (41-22) 338.83.38

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

Date of mailing (day/month/year) 27 September 2001 (27.09.01)	IMPORTANT NOTICE
Applicant's or agent's file reference 1799/PCT	International application No. PCT/CH01/00152
The applicant is hereby notified that, at the time of establishment of this Notice, the time limit under Rule 48.1 for making amendments under Article 19 has not yet expired and the International Bureau had received neither such amendments nor a declaration that the applicant does not wish to make amendments.	

PATENT COOPERATION TREATY

46

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
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Date of mailing <i>(day/month/year)</i>	05/09/2001
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Applicant's or agent's file reference 1799/PCT

FOR FURTHER ACTION	See paragraphs 1 and 4 below
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International application No. PCT/CH 01/ 00152

International filing date <i>(day/month/year)</i>	09/03/2001
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Applicant SYNTHES AG CHUR
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1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

Filing of amendments and statement under Article 18:

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 90bis.1 and 90bis.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  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

Authorized officer Stefan Filus
--

VJ

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 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 203(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.

18

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 48.4)

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).

Consequence 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 Office, 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.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 1799/PCT	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, Item 5 below.	
International application No. PCT/CH 01/ 00152	International filing date (day/month/year) 09/03/2001	(Earliest) Priority Date (day/month/year) 24/03/2000
Applicant SYNTHES AG CHUR		

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.

☒ 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 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

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

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

4. With regard to the title,

☒ 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,

☒ 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.

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

7

☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CH 01/00152

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61B17/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A61B F16L

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 95 22294 A (SURGICAL ACCESSORIES INC) 24 August 1995 (1995-08-24) page 11, line 20 -page 12, line 27 page 15, line 15 -page 18, line 25; figures 9-17	1,2, 5-10,12 6,13
X Y	US 4 966 600 A (SONGER ROBERT J ET AL) 30 October 1990 (1990-10-30) column 4, line 14 - line 46 column 5, line 1 - line 18; figures 1,2	1-3,6-13 6,13
X	US 5 702 399 A (SONGER ROBERT J ET AL) 30 December 1997 (1997-12-30) column 4, line 17 -column 5, line 22; figures 1-3	1,7-10, 12
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ 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)
- "C" 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

28 August 2001

Date of mailing of the international search report

05/09/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040, Tx 31 651 epo nl,
Fax (+31-70) 340-3016

Authorized officer

Georgiou, Z

INTERNATIONAL SEARCH REPORT

International Application No PCT/CH 01/00152

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 5 649 927 A (KILPELA THOMAS S ET AL) 22 July 1997 (1997-07-22)	1
A	column 3, line 47 -column 4, line 60; figures 1,3,5,6 -----	9,12
A	US 5 928 237 A (FARRIS ROBERT A ET AL) 27 July 1999 (1999-07-27) column 2, line 61 -column 3, line 19 column 3, line 35 -column 4, line 10 column 4, line 59 -column 5, line 25; figures 1-9,14 -----	1,6-8, 10-13
A	US 4 262 391 A (PEASH DOUGLAS E) 21 April 1981 (1981-04-21) column 2, line 43 -column 3, line 23; figures 1-3 -----	1,9,12
A	US 5 500 018 A (SPOTORNO LORENZO ET AL) 19 March 1996 (1996-03-19) figure 1A -----	1,9,12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/CH 01/00152

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 9522294	A	24-08-1995	AU	1967095 A	04-09-1995
			US	5772663 A	30-06-1998
US 4966600	A	30-10-1990	US	5116340 A	26-05-1992
US 5702399	A	30-12-1997	NONE		
US 5649927	A	22-07-1997	AU	7169396 A	17-04-1997
			WO	9711654 A	03-04-1997
US 5928237	A	27-07-1999	US	5569253 A	29-10-1996
			US	6077268 A	20-06-2000
			AU	2101895 A	17-10-1995
			EP	0755229 A	29-01-1997
			JP	9510890 T	04-11-1997
			WO	9526165 A	05-10-1995
US 4262391	A	21-04-1981	NONE		
US 5500018	A	19-03-1996	EP	0616796 A	28-09-1994
			AT	166563 T	15-06-1998
			DE	59308612 D	02-07-1998

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) 28.06.2002

Applicant's or agent's file reference

1799/PCT

IMPORTANT NOTIFICATION

International application No.
PCT/CH01/00152

International filing date (day/month/year)
09/03/2001

Priority date (day/month/year)
24/03/2000

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.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523658 apmu d
Fax: +49 89 2399 - 4465

Authorized officer

Wicha, M

Tel. +49 89 2399-7281



PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 1799/PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/418)	
International application No. PCT/CH01/00152	International filing date (day/month/year) 09/03/2001	Priority date (day/month/year) 24/03/2000
International Patent Classification (IPC) or national classification and IPC A81B17/58		
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 supporting 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 03/09/2001	Date of completion of this report 28.08.2002
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80288 Munich Tel. +49 89 2399 - 0 Tx: 523656 apmu d Fax +49 89 2399 - 4485	Authorized officer Georgiou, Z Telephone No. +49 89 2399 2334 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/CH01/00152

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:

3-8 as originally filed

1,2 as received on 24/04/2002 with letter of 19/04/2002

Claims, No.:

1-9 as received on 24/04/2002 with letter of 19/04/2002

Drawings, sheets:

1/14-14/14 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:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/CH01/00152**

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ 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	1-9
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-9
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-9
	No:	Claims	

2. Citations and explanations
see separate sheet

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/CH01/00152

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 present invention relates to a fastening device for surgical cables for fixing bones.

The closest prior art document is WO-A-95/22294 (D1).

By the features of the geometrical configuration of the fastening devices, namely the arrangement of the rear bridging portion and its length relative to the front bridging portion the subject-matter of claim 1 enables access to the free end of the fixing cable while avoiding potential kinking thereof. Thus, Claim 1 fulfils the requirements of Art. 33(2), (3) and (4) PCT.

Claims 2-9 relate to preferred embodiments of the subject-matter of Claim 1 and thus they also fulfil the requirements of Art. 33(2) to (4) PCT.

SURGICAL CABLE CRIMP

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The present invention is directed to an orthopedic instrument in general, and in particular to a fastening or crimping device for use with surgical cables in fixation of bones during surgeries for fractured bone or bone reconstruction according to the preamble of claim 1.

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In surgical and orthopedic operative techniques, it is frequently necessary to fix bone parts, which have been separated surgically or because of fracture, in an exact mutual position and to join them together under pressure. Surgical cable and crimp assemblies are frequently used for this purpose. The cables are used to encircle the bone, or bone and plate, to provide for fixation. In fixation by cable, it is customary to use a fastening device, typically a crimp device which is adapted to be deformed upon the cable for securing the cable in place, encircling the bone in the fracture area. Such assemblies can be subjected to very high tensile forces when, for example, the fractured bone is subjected to a high bending moment. It is therefore important that the cable and crimp assembly have sufficient strength to prevent cable failure under tensile force.

20

Typically, the cable must be used in a subcutaneous confined area. Thus it is important that the cable and crimp assembly be easy to assemble in such a restricted area. For instance, it is desirable to have a device which allows the cable to pass easily through the crimp member to prevent kinking and possible fraying of the cable where it enters the crimp member. Also it is advantageous to have easy access to the crimp device to facilitate crimping. Easy cable access is also desirable to provide room for the application of a tension tool to tighten the cable around the bone. Furthermore, it is desirable to maintain the bulk of the cable as well as the joint where the cable is affixed to itself as compact as possible to minimize discomfort to the patient and damage to the surrounding tissue.

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A wide variety of devices for crimping a surgical wire are known in the art.

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A fastener and tensioner for bone securing cable according to the preamble of claim is known from WO95/22294. The disadvantage of this known device consists in the relatively sharp edges of the free end of the two legs receiving the cable and in the relatively low mechanical stability of the V-shaped body. It lacks compactness and strength which are needed for use as an implant.

From US-A 4,966,600 crimping pliers are known for crimping a crimp member. From US-A
5 5,649,927 a cable crimp system is known in which both ends of the cable have been
inserted in one single through hole, so that no angle is obtained between the cable
sections in the crimp member. From US-A 5,702,399 a surgical cable screw connector is
known. Its disadvantage is the necessity of a separate screw for securing one end of the
cable, said screw adding to the invasiveness of the implant.

10 Although these devices are quite successful from a technical point-of-view in achieving the
desired crimping of surgical wire, most of existing devices have practical limitations. For
example, most crimping devices maintain the surgical wire or cable parallel to itself in the
fastening or crimping member which makes it difficult to access the free end of the cable
and tighten around the bone. In addition, some crimping devices require that the entire
15 fastening or crimping member be crimped in order to secure the surgical wire thereto,
necessitating a larger access area to permit a crimping tool to access the entire fastening
or crimping member.

Other crimp devices exist which are substantially "L" shaped and maintain the surgical wire
20 or cable at a 90° angle to itself as it leaves the fastening or crimping member. Maintaining
the cable at such a steep angle can put a kink in the cable at that location and increase
the likelihood that the cable will break. Furthermore, when the crimping member maintains
the cable at a 90° angle, it is more difficult to insert the cable through the crimp member.
Thus, there exists a need for an improved surgical crimp device that is compact,
25 sufficiently strong, and easy to assemble in a confined area.

The present invention is directed to a fastening device for use with surgical cables in
fixation of bones during surgeries for fractured bone or bone reconstruction according to
claim 1.

30 In one embodiment, the front and rear ends of the crimp member are rounded and the
front end of the crimp member can have a smaller arc length than the rear end.

In another embodiment, the front end of the crimp member is solid and the rear end has
a longitudinal slot.

35 In yet another embodiment, the crimp member has an open central portion that forms a
substantially triangular cutout.

In an alternative embodiment, the second end of the cable has a leader to facilitate
handling.

5

Claims

1. A fastening device for use with surgical cables in fixation of bones during surgeries
10 for fractured bone or bone reconstruction comprising:
a crimp member (20) comprising:
a first leg with first and second ends, the first end having a blind hole (27;64) for
receiving and fixing an end of a cable (50;80),
a second leg with first and second ends and a through bore (29;65) extending from
15 the first end to the second end of the second leg, whereby said second leg is crimpable;
a front bridging portion having connecting the second end of the first leg to the
second end of the second leg; whereby
said first and second leg are disposed at a non-parallel angle with respect to each
20 other;
characterized in that
A) the crimp member (20) further comprises a rear bridging portion connecting the first
end of the first leg to the first end of the second leg; whereby
B) said rear bridging portion is longer than the front bridging portion.
- 25 2. The device according to claim 1, characterized in that said rear bridging portion
and said front bridging portion are rounded.
- 30 3. The device according to claim 1 or 2, characterized in that it further comprises a
centrally disposed triangular opening extending through said crimp member (20)
vertically relative to said blind hole (27;64) and said through hole (29;65).
- 35 4. The device according to one of the claims 1 to 3, characterized in that said front
bridging portion is solid and said the rear bridging portion has a longitudinal slot
(23).

5. The device according to one of the claims 1 to 4, characterized in that said first and second leg have planar side-wall sections (33,34).
5
6. The device according to one of the claims 1 to 5, characterized in that it has a planar top surface (31) and a planar bottom surface (32) which are parallel to each other and parallel to said blind hole (27;64) and said through hole (29;65).
10
7. The device according to one of the claims 1 to 6, characterized in that it further comprises a flexible cable (50;80) having first and second ends (51;52), one of which is fixedly secured to said blind hole (27;64) and the other of which is insertable through said through hole (29;65) for forming a loop of adjustable diameter.
15
8. The device according claim 7, characterized in that said cable (50;80) is multi-stranded.
20
9. The device according claim 7 or 8, characterized in that said the insertable end of said cable (50;80) has a leader to facilitate handling.
25
- 30
- 35

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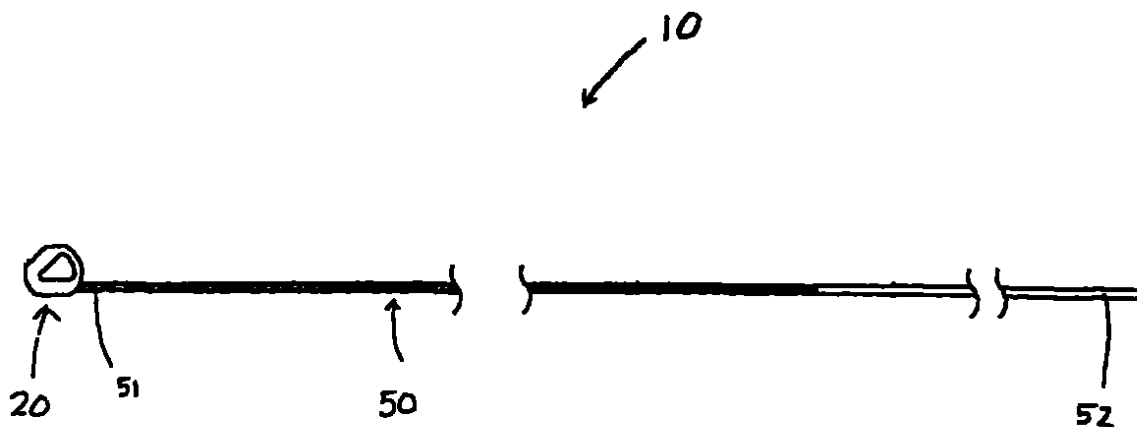
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(54) Title: SURGICAL CABLE CRIMP



(57) Abstract: A surgical cable crimp device including a cable (50; 80) with a fixed and a free end and a crimp member (20) for securing the cable (50; 80). The crimp member (20) has a first leg having a blind hole for receiving the fixed end of the cable (50; 80), and a second leg with a through bore extending through the second leg for receiving the free end of the cable (50; 80), the first and second legs connected in the front by a front bridging portion and in the back by a rear bridging portion. The rear bridging portion is longer than the front bridging portion so that the crimp member (20) has a wedge-shape and the second leg is crimpable so that the cable (50; 80) is crimped to the crimp member (20) after the free end is inserted in the through bore.

WO 01/70122 A1

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SURGICAL CABLE CRIMP

The present invention is directed to an orthopedic instrument in general, and in particular to a fastening or crimping device for use with surgical cables in fixation of bones during surgeries for fractured bone or bone reconstruction according to the definition of claims 1, 9 and 12.

In surgical and orthopedic operative techniques, it is frequently necessary to fix bone parts, which have been separated surgically or because of fracture, in an exact mutual position and to join them together under pressure. Surgical cable and crimp assemblies are frequently used for this purpose. The cables are used to encircle the bone, or bone and plate, to provide for fixation. In fixation by cable, it is customary to use a fastening device, typically a crimp device which is adapted to be deformed upon the cable for securing the cable in place, encircling the bone in the fracture area. Such assemblies can be subjected to very high tensile forces when, for example, the fractured bone is subjected to a high bending moment. It is therefore important that the cable and crimp assembly have sufficient strength to prevent cable failure under tensile force.

Typically, the cable must be used in a subcutaneous confined area. Thus it is important that the cable and crimp assembly be easy to assemble in such a restricted area. For instance it is desirable to have a device which allows the cable to pass easily through the crimp member to prevent kinking and possible fraying of the cable where it enters the crimp member. Also it is advantageous to have easy access to the crimp device to facilitate crimping. Easy cable access is also desirable to provide room for the application of a tension tool to tighten the cable around the bone. Furthermore, it is desirable to maintain the bulk of the cable as well as the joint where the cable is affixed to itself as compact as possible to minimize discomfort to the patient and damage to the surrounding tissue.

A wide variety of devices for crimping a surgical wire are known in the art. Examples of such crimp devices include those described in U.S. Patent No. 5,810,825 issued to Huebner, U.S. Patent Nos. 5,868,748 and 5,720,747 to Burke. Although these

5 devices are quite successful from a technical point-of-view in achieving the desired crimping of surgical wire, most of existing devices have practical limitations. For example, most crimping devices maintain the surgical wire or cable parallel to itself in the fastening or crimping member which makes it difficult to access the free end of the cable and tighten around the bone. In addition, some crimping devices require that the entire fastening or crimping member be crimped in order to secure the surgical wire thereto, necessitating a
10 larger access area to permit a crimping tool to access the entire fastening or crimping member.

Other crimp devices exist which are substantially "L" shaped and maintain the surgical wire or cable at a 90° angle to itself as it leaves the fastening or crimping member. Maintaining the cable at such a steep angle can put a kink in the cable at that location and
15 increase the likelihood that the cable will break. Furthermore, when the crimping member maintains the cable at a 90° angle, it is more difficult to insert the cable through the crimp member.

Thus, there exists a need for an improved surgical crimp device that is compact,
20 sufficiently strong, and easy to assemble in a confined area.

The present invention is directed to a surgical fastener device for fixing bone elements comprising a flexible cable having first and second ends attached to a crimp member. The crimp member has first and second portions extending between front and
25 rear ends. First and second portions are spaced farthest apart at the rear end to form a wedge-shape. Additionally, a channel extends through the second portion. The first end of the cable is fixedly secured to the first portion at the rear end, and the second end of the cable is insertable through the channel of the second portion for forming a loop of adjustable diameter.
30

In one embodiment, the front and rear ends of the crimp member are rounded and the front end of the crimp member can have a smaller arc length than the rear end.

In another embodiment, the front end of the crimp member is solid and the rear end has a longitudinal slot.

35 In yet another embodiment, the crimp member has an open central portion that forms a substantially triangular cutout.

In an alternative embodiment, the second end of the cable has a leader to facilitate handling.

In an additional embodiment, the cable is multi-stranded.

5 In another embodiment, the first and second portions of the crimp member are coplanar.

The present invention is further directed to a surgical fastener device for crimping surgical cable. The device includes a crimp member comprising a wedge-like body having first and second parallel major surfaces vertically interconnected by a peripheral edge.
10 The body has a centrally disposed triangular opening vertically extending through the body from the first major surface to the second major surface. The body also has a pair of channels extending longitudinally through the body. The channels are disposed at a non-parallel angle with respect to each other.

15 In an alternative embodiment, the device further includes a flexible cable secured to one of the channels of the crimp member. The cable has first and second ends and one end is fixedly attached to the crimp member and the other end is insertable through the other channel for forming a loop of adjustable diameter. The cable can be multi-stranded and the insertable end can have a leader to facilitate handling.

20 The present invention is also directed to a surgical fastening device comprising a cable having a free end and a fixed end attached to a crimp member. The crimp member has a first leg with first and second ends. The first end has a blind hole for receiving the fixed end of the cable. The crimp member also has a second leg with first and second ends. The second leg has a through bore extending from the first end to the second end
25 of the second leg. The crimp member also has a front bridging portion connecting the second end of the first leg to the second end of the second leg. The crimp member also has a rear bridging portion connecting the first end of the first leg to the first end of the second leg. The rear bridging portion is longer than the front bridging portion so that the crimp member has a wedge-shape. The second leg is crimpable so that the cable is
30 crimped to the crimp member after the free end is inserted in the through bore.

In another embodiment, the cable is multi-stranded and the free end has a leader to facilitate handling.

35 Figure 1 is a top view of a surgical crimp device according to the present invention showing a flexible cable and a crimp member;

Figure 2 is a perspective view of the crimp member of Figure 1 prior to assembly
5 with the cable;

Figure 3 is a top view of the crimp member of Figure 2 with a cutaway showing
cross sections of internal channels therein;

Figure 4 is a front view of the crimp member of Figure 2;

Figure 5 is a back view of the crimp member of Figure 2;

10 Figure 6 is a magnified view of Figure 1 with an enlargement of the first end of the
cable;

Figure 7 is a side view of the surgical crimp device of Figure 1 after the device has
been crimped around a bone;

15 Figure 8 is a side view of the surgical crimp device of Figure 7 showing the crimp
member in a low profile position;

Figure 9 is a top view of the surgical crimp device of Figure 8;

Figure 10 is a side view of the crimp member of Figure 2;

Figure 11 a top view of an alternative embodiment of the surgical crimp device;

20 Figure 12 is a perspective view of an alternative embodiment of the crimp member;

Figure 13 is a top view of the crimp member of Figure 9 with a cutaway showing
cross sections of the internal channels therein; and

Figure 14 is a perspective view of the crimp member of Figure 9 showing a cable
extending therethrough;

25

As shown in Fig. 1, a surgical crimp device 10 according to the present invention
includes a crimp member 20 and a flexible cable 50. Cable 50 can be either a single
strand wire or a multi-wire stranded cable. A first end 51 of the cable is fixedly attached
30 to crimp member 20 and a second end 52 of the cable is a free end.

30

As best seen in Figs. 2-5, crimp member 20 preferably has a wedge-shape with a
generally triangular perimeter. For ease in handling, the corners are rounded or smoothed
rather than meeting at sharp points. The crimp member preferably has a planar top
surface 31, a spaced parallel planar bottom surface 32, and a perimeter surface 30
35 extending vertically therebetween. Perimeter surface 30 has two sidewall sections 33 and
34, a front wall section 35, and a base wall section 36. Sidewall sections 33 and 34 are
displaced at a non-parallel angle with respect to each other. Preferably sidewall sections
33 and 34 are at an acute angle with respect to each other. Sidewall sections 33 and 34

are connected by a rounded front wall section 35 at the front end or vertex. At the back
5 end or base, the two sidewall sections are connected by a rounded base wall section 36.
The rounded base wall section preferably has a larger radius of curvature than front wall
section 35.

Crimp member 20 preferably has a vertical cutout 24. In the preferred embodiment
vertical cutout 24 is generally triangular. Preferably cutout perimeter surface 45 is similar
10 to the crimp member perimeter surface 30 such that cutout 24 has side sections 37 and
38 which are parallel to the perimeter sidewall sections 33 and 34 respectively. The cutout
side sections are connected at the front end or apex by a rounded front section 39 and at
the back end or base by a rounded base section 40. The rounded base section 40 of the
15 cutout preferably has a larger radius of curvature than the front section 39.

In the embodiment shown in Figs. 2-5, cutout side section 37 and perimeter
sidewall section 33 together define a first leg 25. Cutout side section 38 and perimeter
sidewall section 34 together define a second leg 26. Cutout front section 39 and perimeter
front wall section 35 together define a nose section 41. Cutout base section 40 and
20 perimeter base wall section 36 together define a bridge section 42. Nose section 41 at the
front end is preferably solid and bridge section 42 at the back end preferably has a
longitudinal slot 23 extending therethrough. Thus, crimp member 20 has first leg 25 and
second leg 26 which are attached at the front end by nose section 41 and extend
longitudinally from the front end of crimp member 20 to the back end or base at a non-
25 parallel, preferably acute, angle. First and second legs 25, 26 are spaced farthest apart
at the back end. First and second legs 25, 26 are horizontally connected at the back end
by bridge section 42.

First leg 25 has an internal blind channel 27 extending longitudinally therein for
receiving first end 51 of cable 50. Channel 27 preferably has one opening located at
30 perimeter base wall section 36 located at the back end of crimp member 20. Preferably
blind channel 27 is cylindrical with a longitudinally extending central axis parallel with
perimeter sidewall section 33 and cutout side section 37. Second leg 26 has a through
channel 29 for receiving second end 52 of cable 50, which extends longitudinally through
35 the entire second leg. Through channel 29 has a front opening 21 at perimeter front wall
section 35 and a base opening 22 at the perimeter base wall portion 36. Preferably,
through channel 29 is cylindrical with a longitudinally extending central axis disposed
parallel to perimeter sidewall section 34 and side section 38 of vertical cutout 24. In Fig.

3, portions of crimp member 20 are broken away to show the internal channels 27 and 29
5 of the first leg 25 and second leg 26 respectively. The longitudinally extending central
axes of these channels are coplanar. First and second legs 25 and 26 have a thickness
slightly larger than the diameter of cable 50 so as to allow cable 50 to be inserted
therethrough.

Referring to Fig. 6, first end 51 of cable 50 is fixedly attached to crimp member 20.
10 Any suitable means for securing first end 51 of cable 50 to crimp member 20 can be used,
such as gluing, welding, swaging, etc. Preferably, first end 51 of cable 50 is inserted in
blind channel 27 of first leg 25 and cable 50 is swaged to the channel to permanently
secure first end 51 of cable 50 to crimp member 20. Second end 52 of cable 50 has a
15 leader portion 53 welded thereto to facilitate handling of cable 50 and entrance of second
end 52 into through channel 29 of second leg 26 during operation.

In order to use the surgical crimp device to secure a cable around a bone, the
surgeon first prepares the area by exposing the patient's bone. Referring to Figures 7-9,
the crimp member is placed against a bone 60 to be mended and second end 52 of th
20 cable is wrapped around bone 60. Second end 52 of cable 50 is then inserted in through
channel 29 of crimp member 20. The cable preferably enters channel 29 through front
opening 21 and exits channel 29 through base opening 22, however, the cable can be
inserted in through channel 29 in a reverse manner. Initially sidewall section 33 is
preferably placed tangent to bone 60 so that crimp member 20 is resting on first leg 25 and
25 second leg 26 is angled away from bone 60. When cable 50 is inserted in through channel
29 and second end 52 exits base opening 22, second end 52 is angled away from bone
60 and toward a surgeon. allowing the cable to angle away from the bone is particularly
advantageous because second end 52 is easier to access by a tensioning tool. Second
30 end 52 of cable 50 is then pulled to bring cable 50 taut around bone 60 with the aid of a
conventional tensioning tool which is not shown in the drawings. When the desired tension
is achieved, second leg 26 is crushed with pliers or a similar crimping instrument as are
known in the art. It is particularly advantageous that second leg 26 is angled away from
bone 60 to allow greater access for a crimping instrument in a confined area. In addition,
35 because only a portion of crimp member 20 is crushed, here second leg 26, less force is
required than crushing the entire crimp member. When second leg 26 is crushed, through
channel 29 is deformed or constricted, preventing movement of cable 50 therethrough to

secure the cable within through channel 29 under tension. Any excess cable that extends
5 beyond the back end can then be cut and removed.

As shown in Figures 8 and 9, crimp member 20 can be pushed over to lay flat after crimping second leg 26, placing either top planar surface 31 or bottom planar surface 32 in contact with bone 60. As a result, the profile of the crimp device in the body is reduced.

For example, after legs 25 and 26 are crimped and crimp member 20 is pushed over to
10 lay flat, the resulting thickness of crimp member 20 is preferably not substantially thicker than the radius of cable 50.

Although cable 50 is shown as a multi-strand wire, the invention can be used with any type of surgical cable, such as a single strand wire. Preferably, the cable used with
15 the proposed crimp is a multi-wire stranded cable. Crimp member 20 and cable 50 are preferably titanium although they may be manufactured from any material suitable for surgical procedures.

Referring to Fig. 10, preferably an arrow, symbol or other indicia is etched on the outside of the second leg to illustrate the preferred direction to insert second end 52 of
20 cable 50 in the through channel 29.

Referring to Fig. 11, another embodiment of the present invention includes a cable 80 having a crimp member as previously described attached on each end. A leader portion 81 is welded onto the cable at the longitudinal center of the cable. When a crimp device, cable 80 is cut in the center of leader portion 81 to yield two identical crimp devices
25 according to the present invention. This embodiment of the present invention provides for efficient manufacturing and storage of the crimp devices.

Referring now to Figs. 12-14, an alternative embodiment of the crimp member has two leg members, first leg 61 and second leg 62, arranged in a generally triangular configuration and attached at the front end or vertex. Leg members 61 and 62 are
30 preferably displaced at a non parallel angle with respect to each other. Preferably leg members 61 and 62 are displaced at an acute angle with respect to one another. Legs 61 and 62 are connected horizontally by a web section 63. In this embodiment, legs 61 and 62 are substantially cylindrical with concentric channels therein. First leg 61 has a blind concentric channel 64 extending longitudinally therein. Blind channel 64 has one opening
35 at the back end of the crimp member. Second leg 62 has a concentric through channel 65 extending through the entire length of leg 62. Through channel 65 has one opening at

the back end and one opening at the front end. A conical chamfer 66 surrounds the
5 openings of channels 64, 65 to guide the entrance of the cable into the channels.

While it is apparent that the illustrative embodiments of the invention herein
disclosed fulfill the objectives stated above, it will be appreciated that numerous
modifications and other embodiments may be devised by those skilled in the art.
Therefore, it will be understood that the appended claims are intended to cover all such
10 modifications and embodiments which come within the scope of the present invention.

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5 Claims

1. A surgical fastener device for fixing bone elements comprising:
a flexible cable (50;80) having first and second ends (51;52); and
a crimp member (20) having first and second portions and extending between front
10 and rear ends with said first and second portions spaced farthest apart at the rear end to
form a wedge-shape, and said second portion having a channel (27;29;64;65) extending
therethrough,
wherein the first end (51) of the cable (50;80) is fixedly secured to said first portion
15 at the rear end and the second end (52) of the cable (50;80) is insertable through the
channel (27;29;64;65) of the second portion for forming a loop of adjustable diameter.
2. The device according to claim 1 wherein the front and rear ends of the crimp
member (20) are rounded.
- 20 3. The device according to claim 2 wherein the front end of the crimp member (20) has
a smaller arc length than the rear end.
4. The device according to claim 1 wherein the front end of the crimp member (20) is
25 solid and the rear end has a longitudinal slot (23).
5. The device according to claim 1 wherein the crimp member (20) has an open
central portion that forms a substantially triangular cutout (24).
- 30 6. The device according to claim 1 wherein the second end (52) of the cable (50;80)
has a leader to facilitate handling.
7. The device according to claim 1 wherein the cable (50;80) is multi-stranded.
- 35 8. The device according to claim 1 wherein the first and second portions of the crimp
member (20) are coplanar.

9. A surgical fastener device for crimping surgical cable (50;80), said device including
5 a crimp member (20) comprising a wedge-like body having first and second parallel major
surfaces vertically interconnected by a peripheral edge, said body having a centrally
disposed triangular opening vertically extending through said body from the first major
surface to the second major surface and a pair of channels (27;29;64;65) extending
10 longitudinally through said body, said channels (27;29;64;65) being disposed at a non-
parallel angle with respect to each other.

10. The device of claim 9 further comprising a flexible cable (50;80) having first and
second ends (51;52), one of which is fixedly secured to one of the channels (27;29;64;65)
15 of the crimp member (20), and the other of which is insertable through the other channel
(27;29;64;65) for forming a loop of adjustable diameter.

11. The device of claim 10 wherein the cable (50;80) is multi-stranded and the
insertable end has a leader to facilitate handling.

20

12. A surgical fastening device comprising a cable (50;80) having free and fixed ends,
and a crimp member (20) comprising:

a first leg with first and second ends, the first end having a blind hole for receiving
the fixed end of the cable (50;80),

25

a second leg with first and second ends and a through bore extending from the first
end to the second end of the second leg,

a front bridging portion having a radius of curvature and connecting the second end
of the first leg to the second end of the second leg, and

30

a rear bridging portion having a radius of curvature and connecting the first end of
the first leg to the first end of the second leg, wherein:

the rear bridging portion is longer than the front bridging portion so that the crimp
member (20) has a wedge-shape and the second leg is crimpable so that the cable (50;80)
is crimped to the crimp member (20) after the free end is inserted in the through bore.

35

13. The device of claim 12 wherein the cable (50;80) is multi-stranded and the free end
has a leader to facilitate handling.

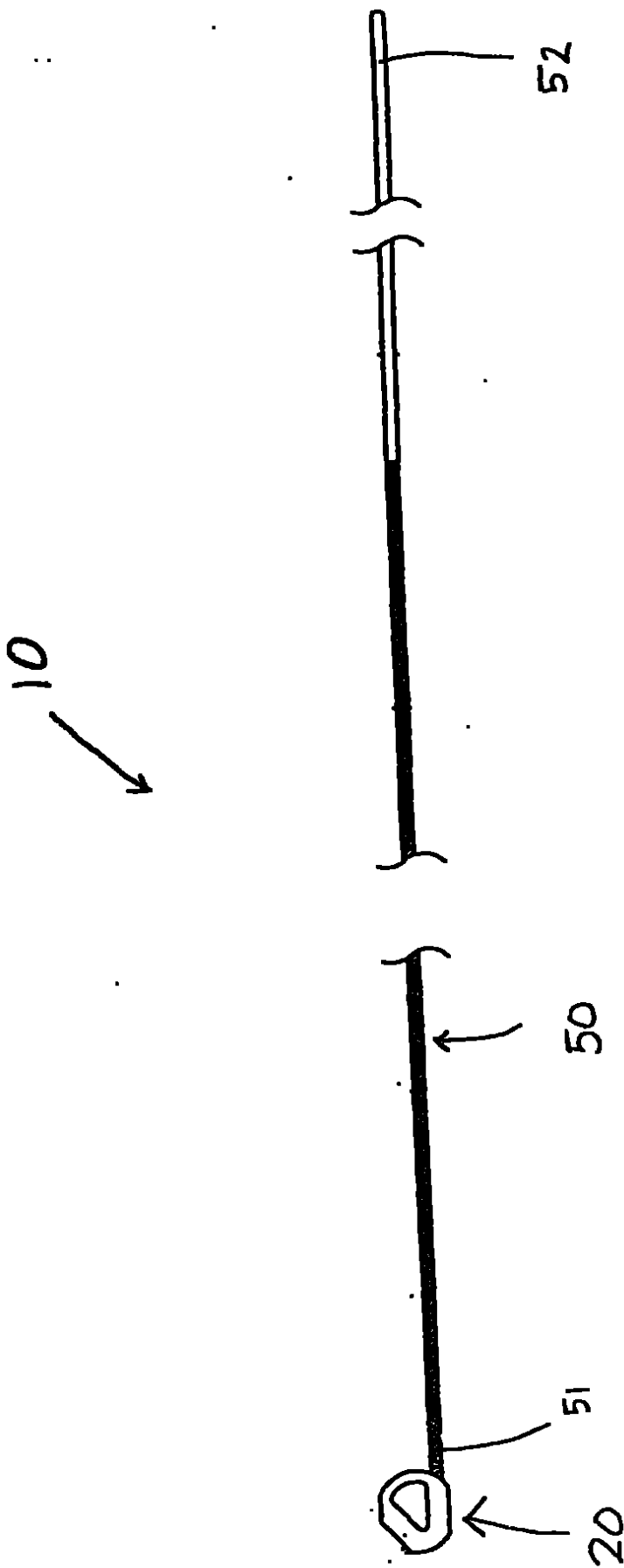


Fig. 1

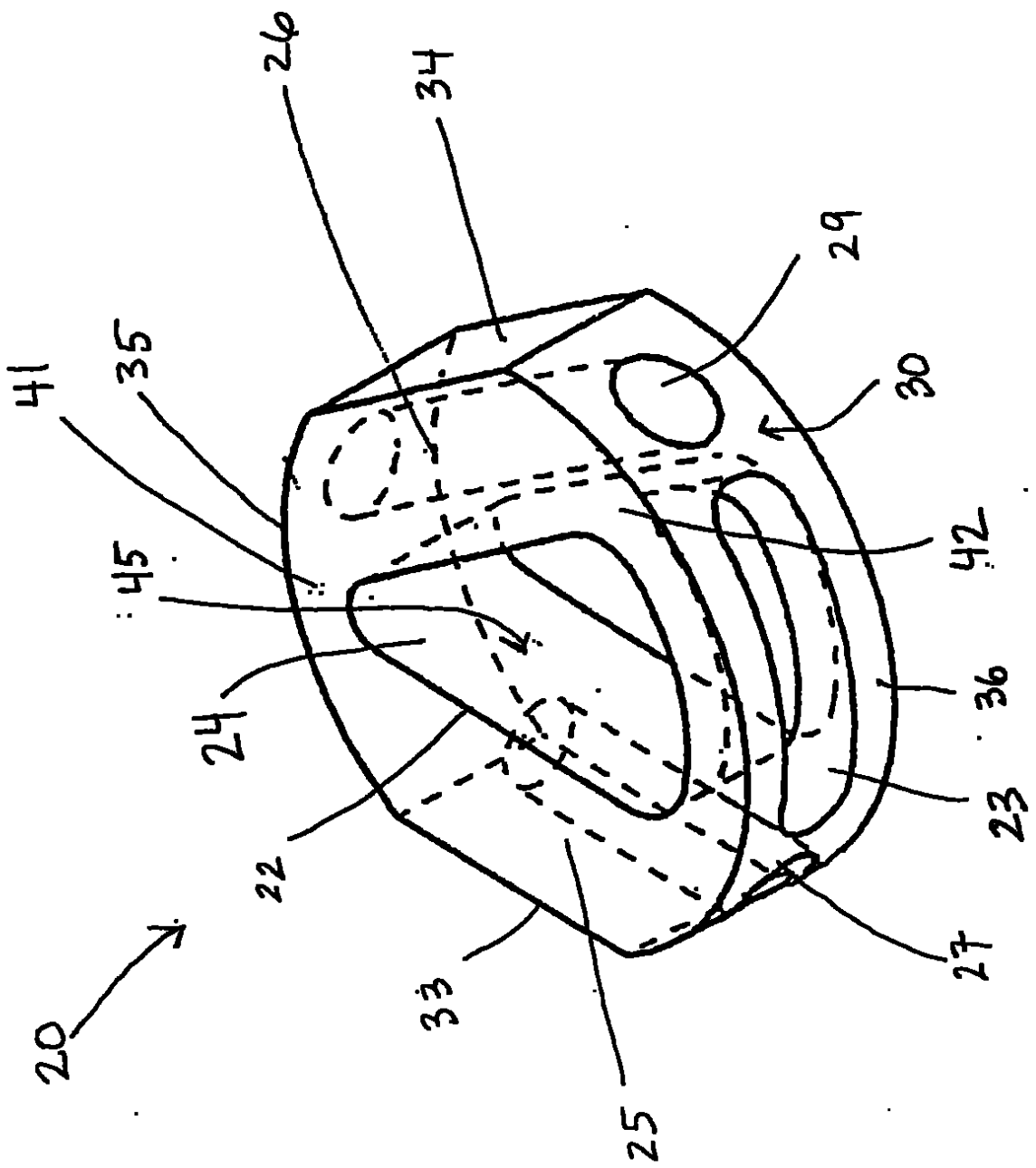


Fig. 2

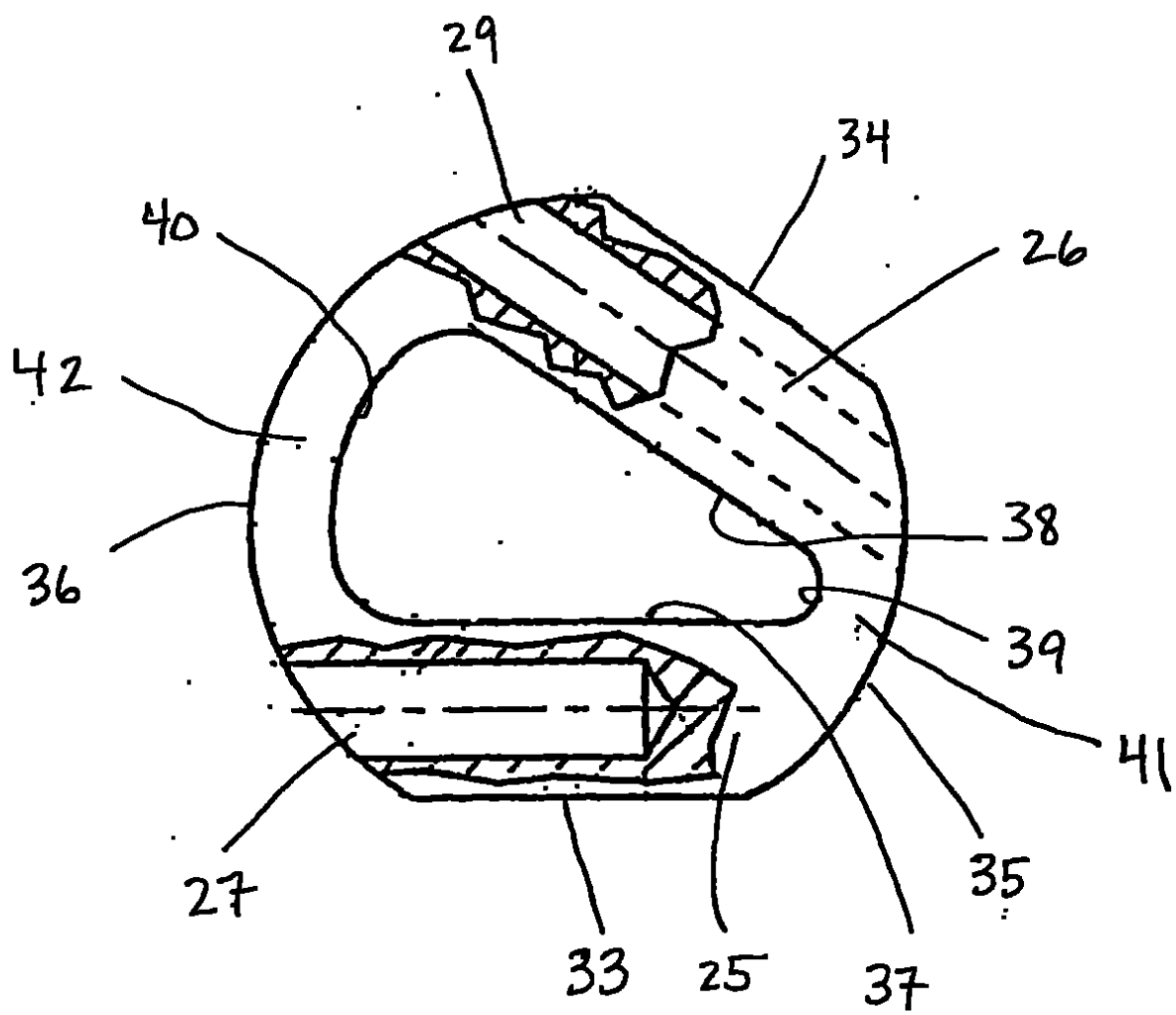


Fig. 3

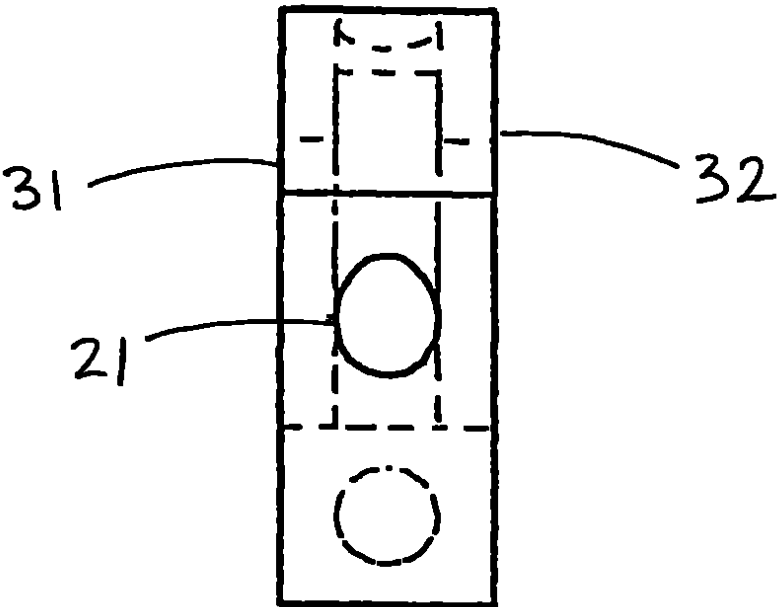


Fig. 4

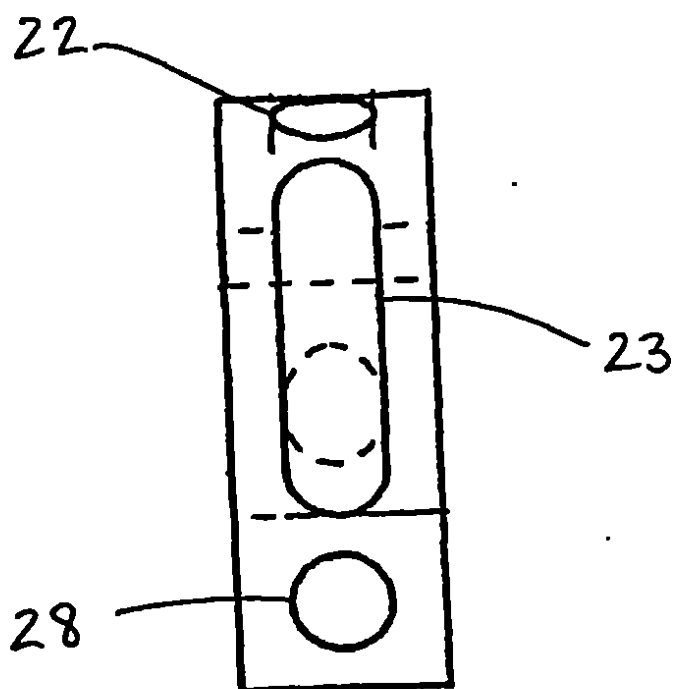


Fig. 5

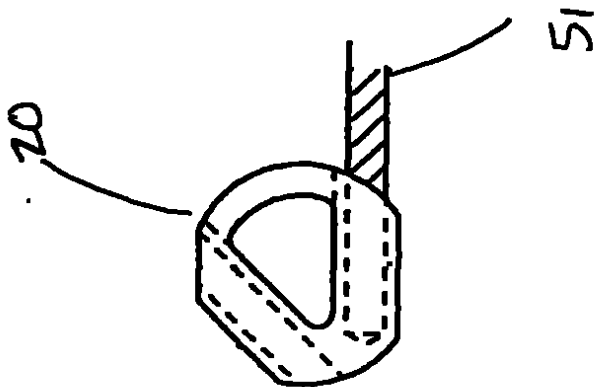


Fig. 6

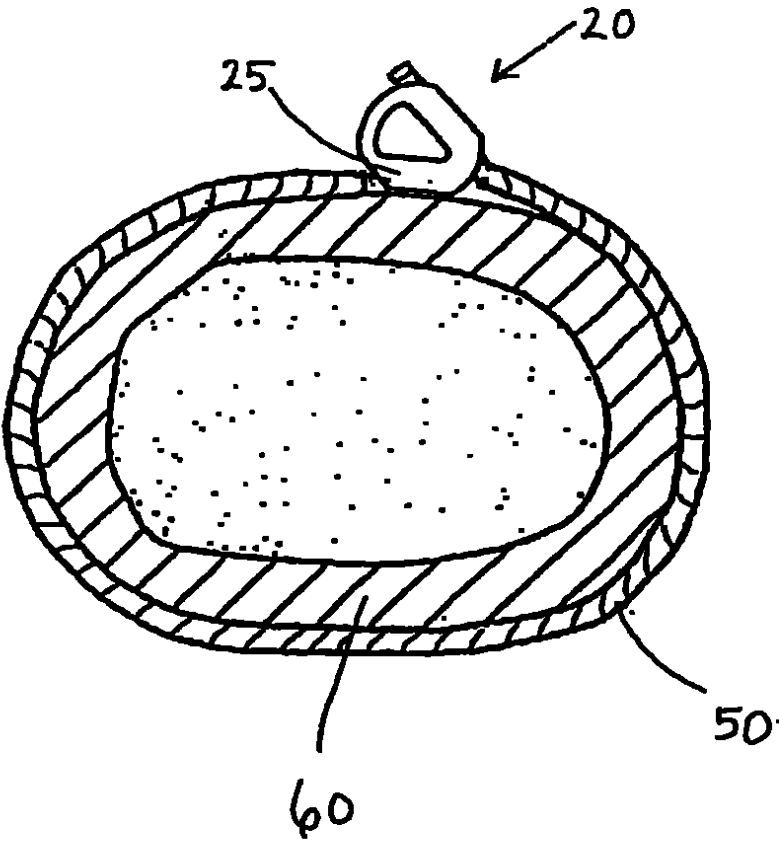


Fig. 7

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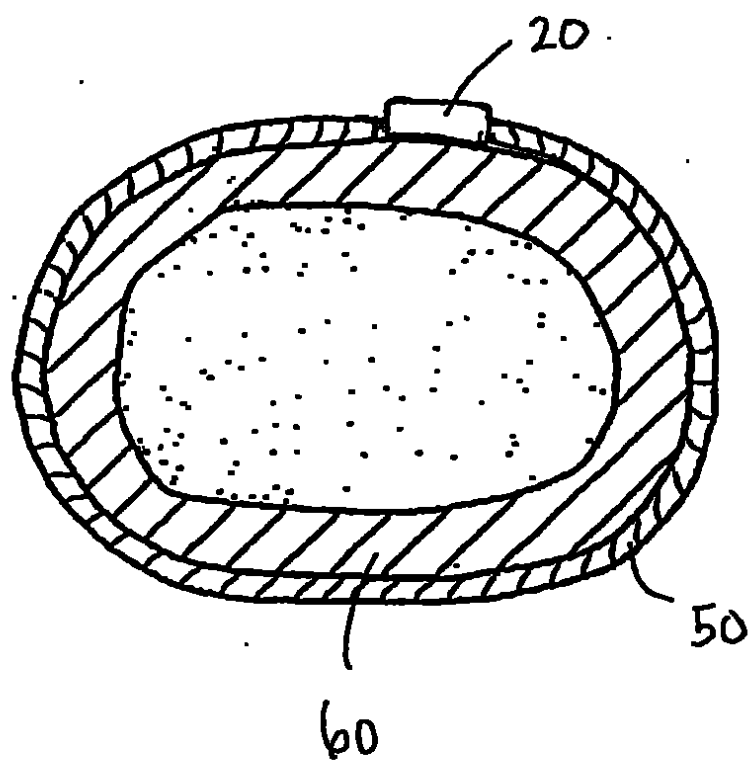


Fig. 8

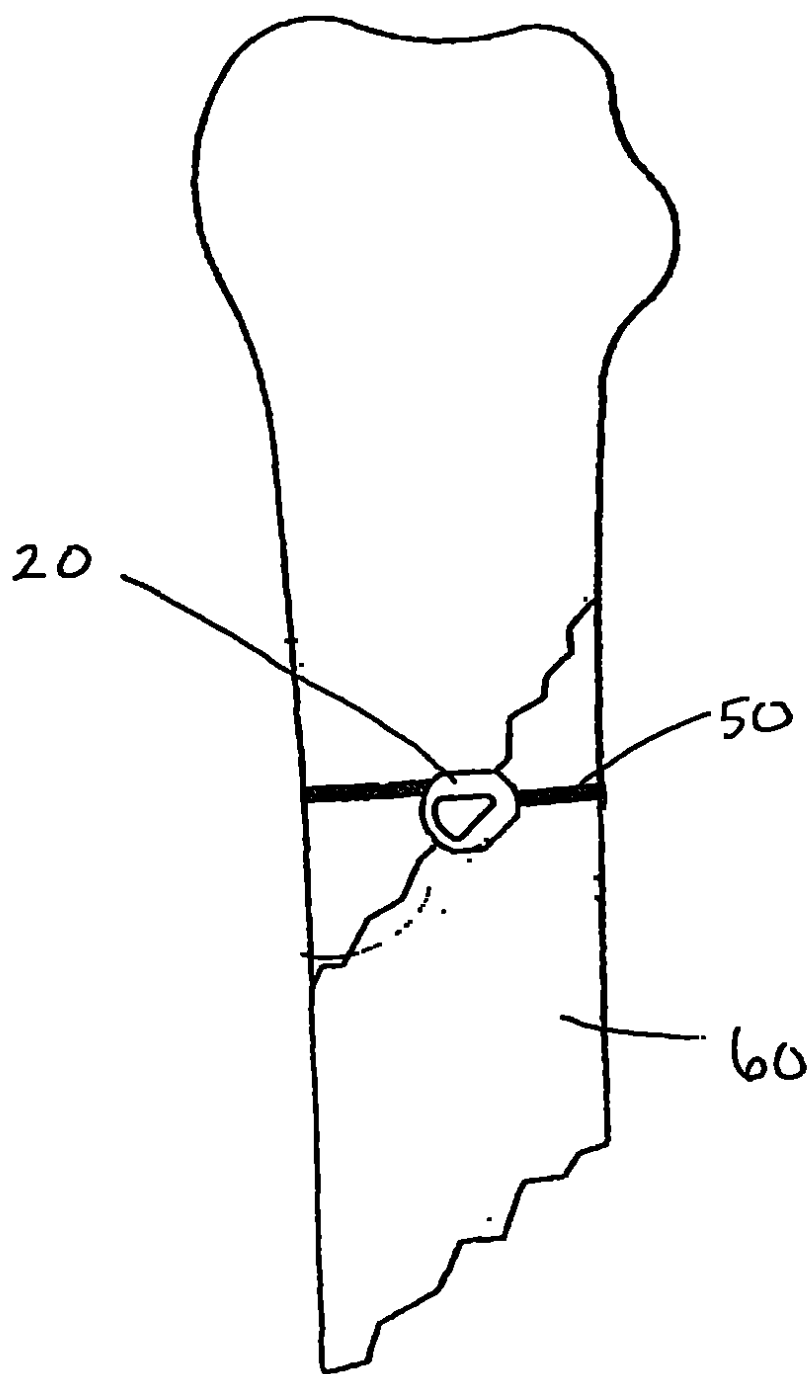


Fig. 9

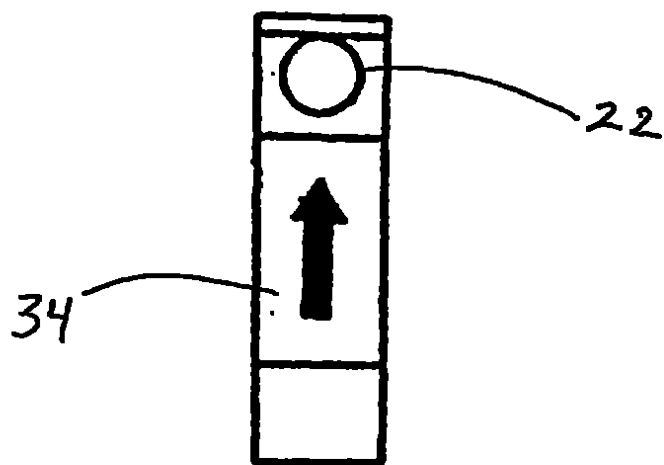


Fig. 10

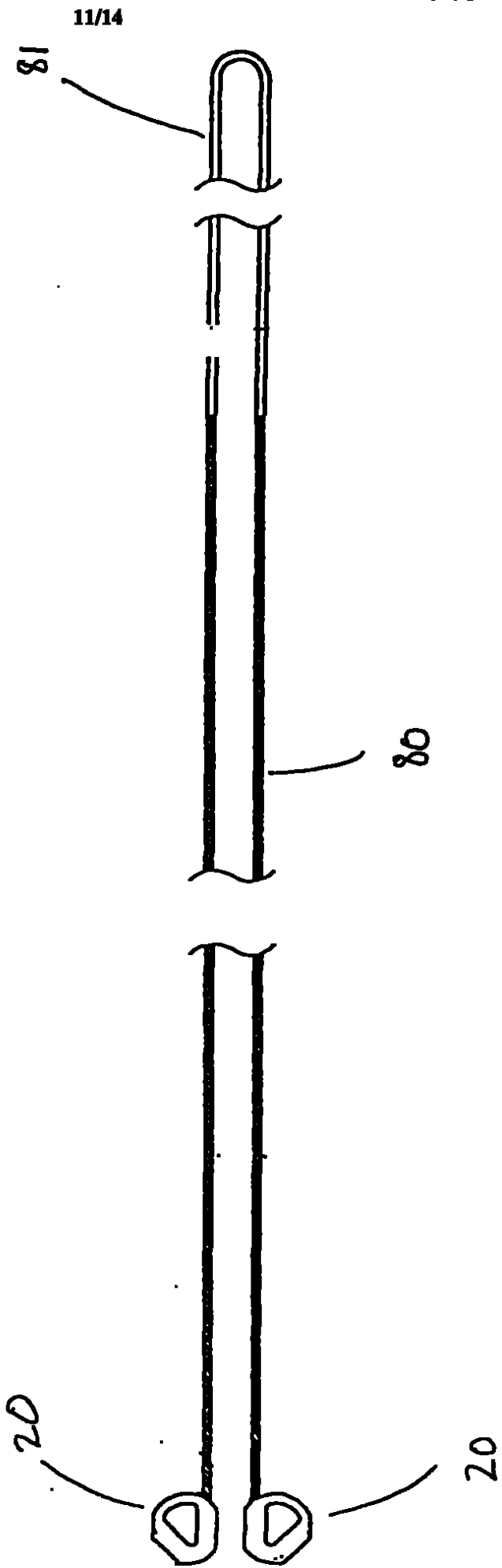


Fig. 11

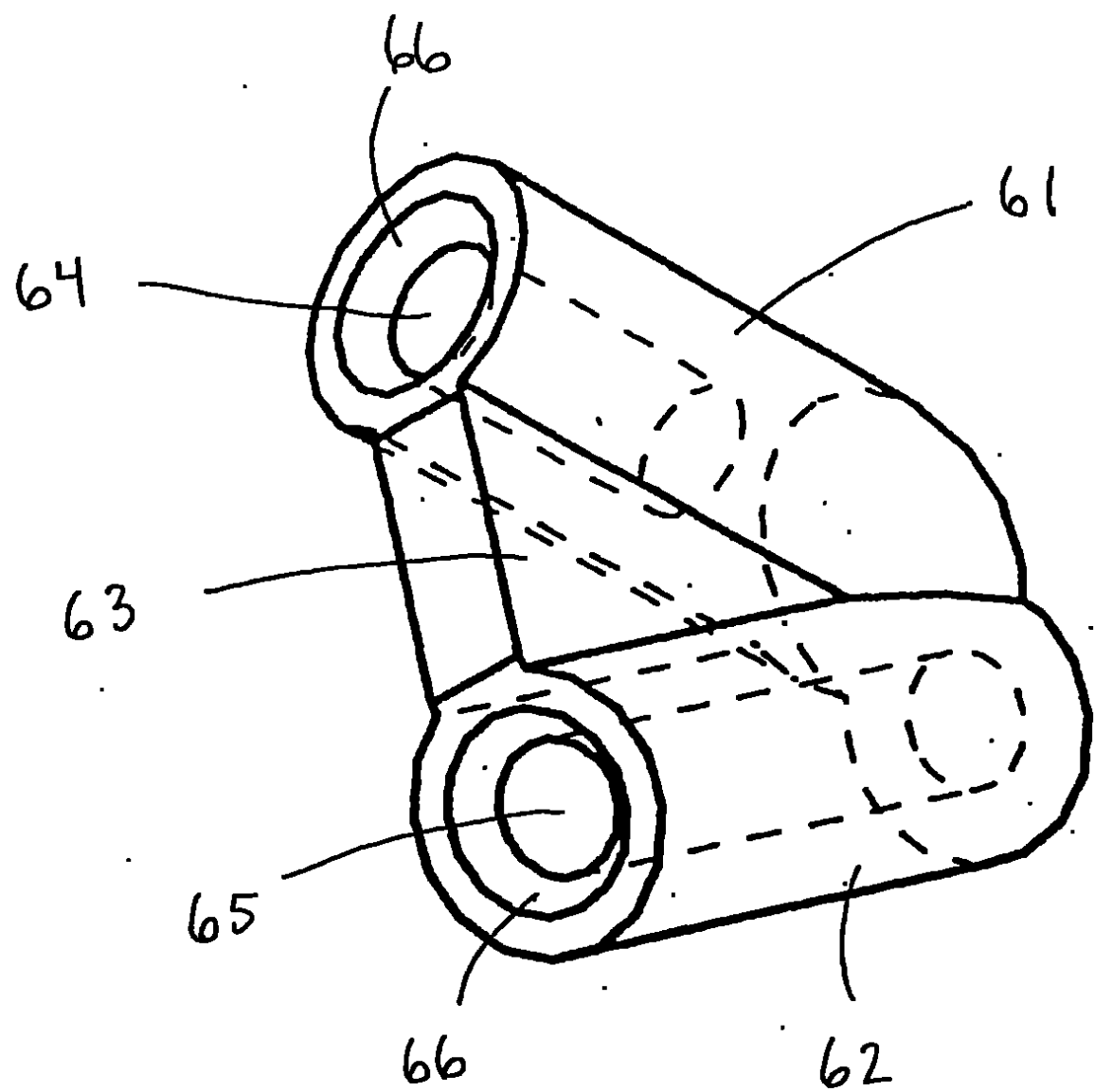


Fig. 12

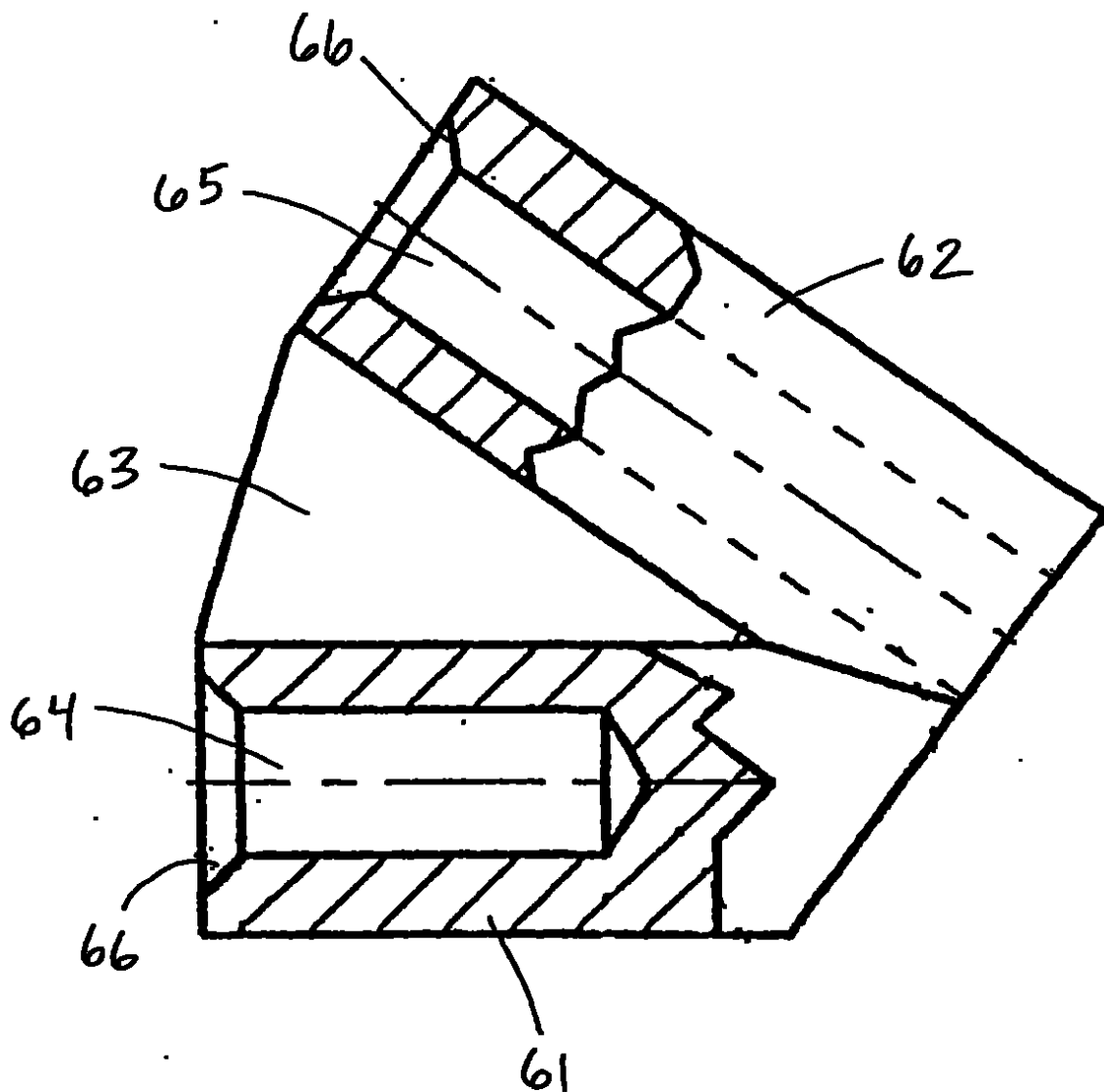


Fig. 13

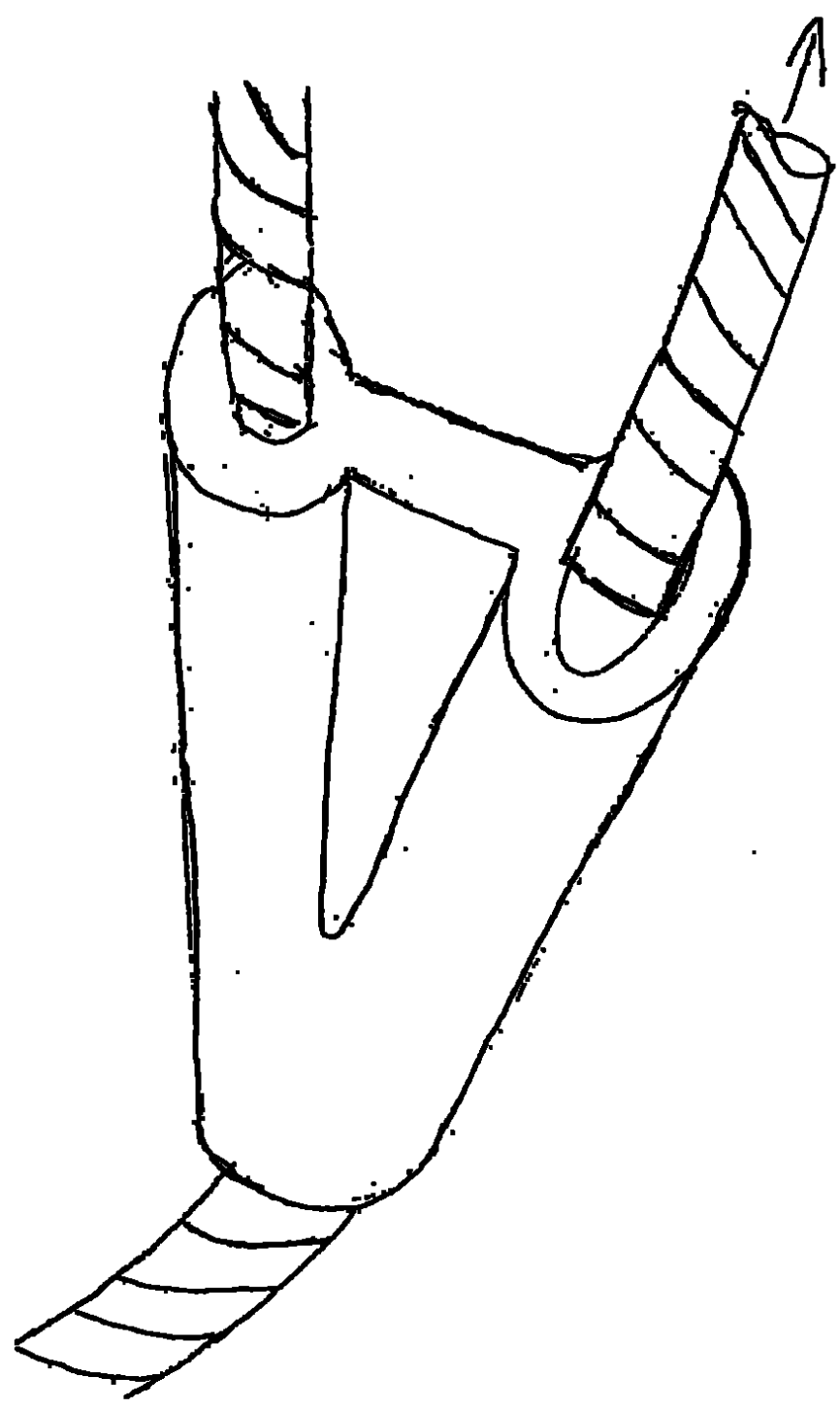


Fig. 14

INTERNATIONAL SEARCH REPORT

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PCT/CH 01/00152

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A61B17/58

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A61B F16L

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, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 95 22294 A (SURGICAL ACCESSORIES INC) 24 August 1995 (1995-08-24)	1,2, 5-10,12
Y	page 11, line 20 -page 12, line 27 page 15, line 15 -page 18, line 25; figures 9-17	6,13
X	US 4 966 600 A (SONGER ROBERT J ET AL) 30 October 1990 (1990-10-30)	1-3,6-13
Y	column 4, line 14 - line 46 column 5, line 1 - line 18; figures 1,2	6,13
X	US 5 702 399 A (SONGER ROBERT J ET AL) 30 December 1997 (1997-12-30)	1,7-10, 12
	column 4, line 17 -column 5, line 22; figures 1-3	
	-/-	

☒ Further documents are listed in the continuation of box C.

☒ 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 claim 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.
- *S* document member of the same patent family

Date of the actual completion of the international search

28 August 2001

Date of mailing of the international search report

05/09/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5618 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 apo nl,
Fax (+31-70) 340-3016

Authorized officer

Georgiou, Z

INTERNATIONAL SEARCH REPORT

Internal application No
PCT/... J1/00152

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 5 649 927 A (KILPELA THOMAS S ET AL) 22 July 1997 (1997-07-22)	1
A	column 3, line 47 -column 4, line 60; figures 1,3,5,6	9,12
A	US 5 928 237 A (FARRIS ROBERT A ET AL) 27 July 1999 (1999-07-27) column 2, line 61 -column 3, line 19 column 3, line 35 -column 4, line 10 column 4, line 59 -column 5, line 25; figures 1-9,14	1,6-8, 10-13
A	US 4 262 391 A (PEASH DOUGLAS E) 21 April 1981 (1981-04-21) column 2, line 43 -column 3, line 23; figures 1-3	1,9,12
A	US 5 500 018 A (SPOTORNO LORENZO ET AL) 19 March 1996 (1996-03-19) figure 1A	1,9,12

INTERNATIONAL SEARCH REPORT

tion on patent family members

Inten Application No
PCT/CH 01/00152

83

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9522294 A	24-08-1995	AU 1967095 A US 5772663 A	04-09-1995 30-06-1998
US 4966600 A	30-10-1990	US 5116340 A	26-05-1992
US 5702399 A	30-12-1997	NONE	
US 5649927 A	22-07-1997	AU 7169396 A WO 9711654 A	17-04-1997 03-04-1997
US 5928237 A	27-07-1999	US 5569253 A US 6077268 A AU 2101895 A EP 0755229 A JP 9510890 T WO 9526165 A	29-10-1996 20-06-2000 17-10-1995 29-01-1997 04-11-1997 05-10-1995
US 4262391 A	21-04-1981	NONE	
US 5500018 A	19-03-1996	EP 0616796 A AT 166563 T DE 59308612 D	28-09-1994 15-06-1998 02-07-1998

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) 1799/PCT

Box No. I TITLE OF INVENTION Surgical Cable Crimp	
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.)	
Synthes AG Chur Grabenstrasse 15 CH-7002 Chur Switzerland	
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.)	
Synthes (U.S.A.) 1690 Russell Road P.O. Box 1766 Paoli, PA 19301-1222 USA	
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.)	
LUSUARDI Werther Dr. Lusuardi AG Kreuzbühlstrasse 8 CH-8008 Zürich Switzerland	
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.	

CAVELIER

ABOGADOS

EDIFICIO SURRY
CARRERA 4ª N° 72-35
BOGOTÁ, S - COLOMBIA

REPRESENTACION Y PODER

I (we), the undersigned / Yo (nosotros), abajo firmado(s)
Synthes AG Chur
of / domiciliado(s) 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. 31829; domiciliados en la Carrera 4ª N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el parágrafo 1º del Artículo 543 del Código de Comercio, el 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 enseñanzas; 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, desistirse, cancelar, recibir, renunciar, y ratificar los actos hechos por agentes oficiosos.

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 enseñanzas.

REPRESENTATION AND POWER OF ATTORNEY

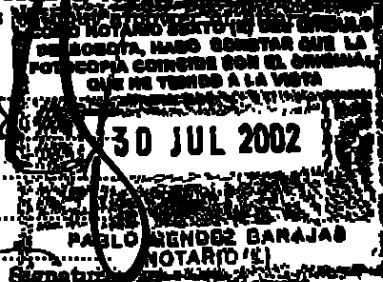
in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint GERMAN CAVELIER, tpa. 832; GONZALO PERDOMO, tpa. 831; ERNESTO CAVELIER, tpa. 11519; and EMILIO FERRERO, tpa. 31829; domiciled at Carrera 4ª N° 72-35, Bogotá, Colombia, the first as principal and 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 the Power of Attorney, compromise, desist, cancel, receive, resign and ratify acts done by representatives

Given and signed this / Dado y firmado hoy

July 21, 1998
in / en **Basel, Switzerland**

Firma

SYNTHES AG CHUR
Grabenstrasse 15
CH-7002 CHUR



TRADUCCION No:
M. V. V. A. MARTELO
Interprete 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 consular 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 "ppa 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 1940, 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 nineteenhundred and ninety eight.

23rd July 1998

Reg. B. No 994

The notary public:



Visto para la legalización de la firma que precede de

Eva Bertossa-Bertschi

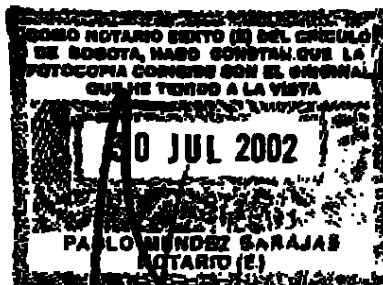
notario del cantón de Berne

Número: 2093 Cancellaria de Estado del cantón de Berna

18/7/98

Carmen Isella

Tasa: CHF 15.-



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

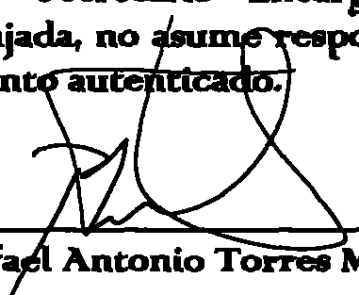
BERNA, 11 DE AGOSTO DE 1.998

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

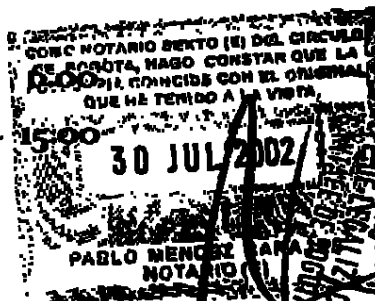
CERTIFICA :

Que la señora **CARMEN ISEL** 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.


Rafael Antonio Torres Martín.

- Pagado Impuesto de Timbre: US\$ 5.00
- Pagado Derechos Consulares: US\$ 15.00



CUYAS FIRMAS APARECE EN EL DOCUMENTO DESEMPEÑA LAS FUNCIONES INDICADAS

MINISTERIO DE RELACIONES EXTERIORES
197889
Torres

98 AUG 21 AM 11:59
NO SE ASUME RESPONSABILIDAD DEL TERA



Consulado de Colombia

Berna

87

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

CERTIFICA

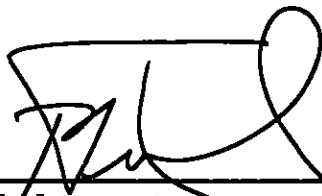
Que la compañía **SYNTHE S.A. CHUR** domiciliada en Grabenstr. 15, Chur/Suiza, existe y esta organizada de conformidad con las leyes de Suiza y que esta cumple con su objeto legal.

Que la señora **MARGRIT JAKES-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
- Pagado derechos consular



MINISTERIO DE RELACIONES
EXTERIORES
177890
CUM FIRMARECE EN EL
DOCUMENTO SE EMPENA
LAS FUNCIONES INDICADAS

NO SE ASUME
RESPONSABILIDAD DEL TEXTO

88

TRADUCCION OFICIAL 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.

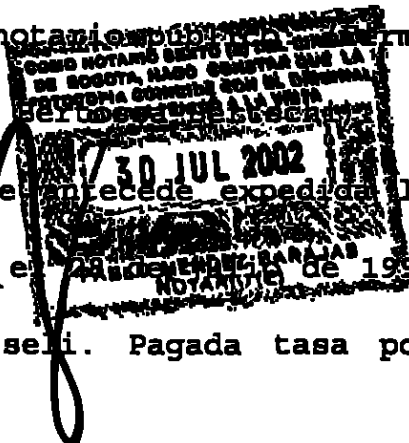
(A continuación se traducen los sellos y legalizaciones de un documento escrito en inglés y español, por el cual SYNTHES AG CHUR otorga poder a GERMAN CAVELIER, GONZALO PERDOMO, ERNESTO CAVELIER Y EMILIO FERRERO). Dado y firmado en Berna, Suiza, el 21 de julio de 1998. (Firma) ppa. M. Jacques SYNTHES 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 el veintitrés 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 por la Cancillería de Estado del Cantón de Berna el 23 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 agosto 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 JAKUES-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 deja copia en esta oficina para su confrontación.

COLO 326-01-001-5
Ago. 31/98
ES: 31/98

COMO NOTARIO SEÑTO (M) DEL CIRCULO DE SUJETA, HAGO CONSTAR QUE LA FOTOCOPIA CONCORDA CON EL ORIGINAL QUE HE TENIDO A LA VISTA

30 JUL 2002

TRADUCCION

MARIA ELVIRA MARTELO

Traductora e interprete Oficial

Inglés - Español - Inglés

Res. No. 259 Min. Justicia

COMO NOTARIO SEXTO DEL CIRCULO DE SANTA FE DE
BOGOTA, HAGO CONSTAR QUE LAS FIRMAS DE
[Firma]
[Firma]
COINCIDEN CON LA FIRMA REGISTRADA POR
EL (ELLOS) EN ESTA NOTARIA
SANTA FE DE BOGOTA. 02 SET 1998

[Firma]

MINISTERIO DE RELACIONES
EXTERIORES
M. 2:6-8-7111
Noria *[Firma]*
Cuya firma aparece en el
DOCUMENTO DESEMPENA
LAS FUNCIONES INDICADAS

COMO NOTARIO SEXTO (E) DEL CIRCULO
DE BOGOTA, HAGO CONSTAR QUE LA
FOTOCOPIA COINCIDE CON EL ORIGINAL
QUE HE TENIDO A LA VISTA
30 JUL 2002
PABLO FENDEZ BARAJAS
NOTARIO (E)

[Firma]

NO SE ASUME
RESPONSABILIDAD DEL TEXTO
98 SEP 11 PM 12:23
GOBIERNO DE LEONARDO RODRIGUEZ
SANTA FE DE BOGOTA

CAVELIER

AB GAD S

90

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

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

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

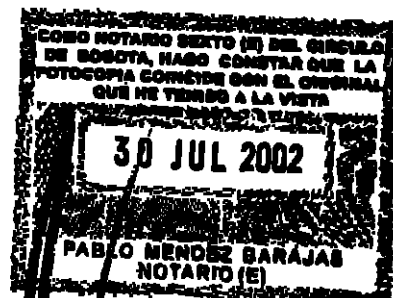
Acepto:



EMILIO FERRERO

T.P.A. N° 31.929

C.C. No. 438.019 de Usaquén



NOTARIA SEXTA DE BOGOTÁ

RECONOCIMIENTO Y PRESENTACIÓN PERSONAL

Bogotá, D. C. Diciembre 14/2001

Ante Mí, PABLO MENDEZ BARAJAS S.

NOTARIO SEXTO ENCARGADO DEL CÍRCULO DE BOGOTÁ

Compareció(eron)

quien(es) exhibió(eron) la(s) C. C. 2877924
438019

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

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.



Expediente No		02066165	No de Folio
Item		No de unidades	
1	CD		
2	DVD		
3	REVISTA		
4	LIBRO		
5	PERIODICO		
6	DISQUETES		
7	SOBRE DE MANILA	4	
8	SOBRE BLANCO TAMAÑO CARTA		
9	SOBRE BLANCO TAMAÑO OFICIO		
10	OTROS:		
Observaciones: arte final			

NIT : 800176089-2

SUPERINDUSTRIA Y COMERCIO (COTA)
 Radicacion : 82966163 00000000 Folios: 32
 Fecha (MM): 2002-07-30 17:07:57
 Trámite : 811 PCT-PATENT 379 FASE INICI 411 PRESENTAC
 Dependencia: 2920 DIVISION DE NUEVAS CREACIONES

RECIBO OFICIAL DE CAJA : 02 - 37,573
 FECHA : JUNIO 11 DE 2002

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	8087302	11/06/2002	45,430,000.00

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

CANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
0005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	378,000.00
	TOTAL :	\$ 378,000.00

SOM: TRESCIENTOS SETENTA Y OCHO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

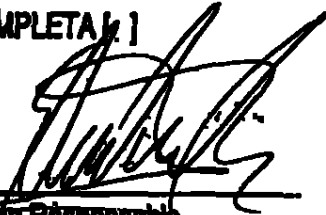
Colo 03261-041-001-6

REQUISITOS NECESARIOS PARA PRESENTACIÓN Y AGILIZACIÓN DEL TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION [X]		
MODELO DE UTILIDAD	[]	[]
• Indicación de que se solicita la concesión de una patente	[]	[]
• Datos de identificación del solicitante o de la persona que presenta la solicitud	[]	[]
• Descripción de la invención	[]	[]
• Dibujos de ser estos pertinentes	[]	[]
• Comprobante de Pago de las tasas establecidas	[]	[]
COMPLETA [X]	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 foto gráfica 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 se solicita el registro de un Esquema de trazado	[]	[]
• Datos de identificación del solicitante o de la persona que presenta la solicitud	[]	[]
• Representación gráfica del esquema de trazado	[]	[]
• Comprobante de pago de las tasas establecidas.	[]	[]
COMPLETA []	INCOMPLETA	[] []


Firma Responsable

SUPERINTENDENCIA Y COMERCIO (COPIA)

Radicación 02066163 00000000 Folios: 92
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Fecha: 011 PCT-PATENT 379 FASE NACI 411 PRESENTAC
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