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CAVELIER

ABOGADOS

www.cavelier.com
cavelier@cavelier.com

EDIFICIO SISKI
CARRERA 4 No. 72-25
BOGOTÁ 8, COL

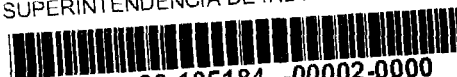
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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 06-105184- -00002-0000

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Dep. 2020 NUECREACIONE

Tra. 11 PATENTELIYH

Eve: 378 FASENACIONALI

Act. 536 PETICION

Folios: 2

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

Trámite : 011

Evento : 378

Actuación : 538

Referencia : Expediente No. 06.105.184
Asunto : Solicitud de Patente para **ELEMENTO ELASTICO
PRODUCIDO DE MATERIAL RADIOBRILLANTE PARA
UN DISPOSITIVO MEDICO.**
Solicitante : **SYNTHE GMBH**
Clase : A61L 031/006
Publicada en : La Gaceta No. 576 Del 31 de mayo de 2007
Fecha de Solicitud : 18 de Octubre de 2006

1. Yo, Emilio FERRERO, identificado como aparece al pie de mi firma, actuando como apoderado en el asunto de la referencia, atentamente, solicito se efectúe el examen de patentabilidad de la solicitud en referencia presentada de acuerdo con el Capítulo I del PCT y según lo establecido en el artículo 44 de la Decisión 486 de la Comisión de la Comunidad Andina. Para tal efecto presento junto con este escrito el recibo por valor de \$404.000.00, que corresponde a la tasa fijada según lo dispuesto en la resolución No. 36155 de 28 de diciembre de 2006.

2. Ruego atentamente a la Señora Jefe se sirva ordenar que se anexe este recibo para que se efectúe dicho examen y se continúe con el trámite de la solicitud.

Señora Jefe,

EMILIO FERRERO

T.P.A. No. 31.929

COLO-15153-841-021-9
ASGNNJND-113217WPC15153
No. M-2007-113217ASG

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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Act: 538 PETICION Folios: 2

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 07 - 91,005
FECHA : NOVIEMBRE 7 DE 2007

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	48825373	07/11/2007	48,438,000.00

***** CONCEPTO *****

CANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-01 SOLICITUDES	85 EXAMEN DE PATENTABILIDAD DE INVEN	404,000.00
	TOTAL :	\$ 404,000.00

SON: CUATROCIENTOS CUATRO MIL PESOS

RESPONSABLE :

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

COLO.15153-841-021-9.

DIVISIÓN DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 06-105184

EL EXTRACTO DE LA PRESENTE SOLICITUD DE **PATENTE DE INVENCION**

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **576** DE

FECHA **31 DE MAYO DE 2007** EL TÉRMINO HÁBIL SEÑALADO POR LA LEY

EXPIRA EL **31 DE AGOSTO DE 2007**

NOTA: Dentro del plazo de los seis (6) meses siguientes a partir de la fecha de publicación en la gaceta de Propiedad Industrial, deberá solicitar y cancelar el examen de patentabilidad so pena de que la solicitud caiga en abandono, de acuerdo con lo establecido en el Artículo 44 de la Decisión 486/2000.

SE PRESENTARON OPOSICIONES POR PARTE DE TERCEROS.

SI _____

NO X

United States Patent [19]

Witzel et al.

[11] Patent Number: 4,920,959
[45] Date of Patent: May 1, 1990

[54] **EXTERNAL FIXTURE FOR OSTEOSYNTHETIS**

- [75] Inventors: Ulrich Witzel, Wittener Str. 73d, 5600 Wuppertal 2; Karl H. Müller, Bochum, both of Fed. Rep. of Germany
- [73] Assignee: Ulrich Witzel, Wuppertal, Fed. Rep. of Germany
- [21] Appl. No.: 138,381
- [22] PCT Filed: Apr. 6, 1987
- [86] PCT No.: PCT/DE87/00146
§ 371 Date: Nov. 20, 1987
§ 102(e) Date: Nov. 20, 1987

- [30] Foreign Application Priority Data
Apr. 4, 1986 [DE] Fed. Rep. of Germany 3611319
- [51] Int. Cl.³ A61B 17/60
- [52] U.S. Cl. 606/53; 606/96
- [58] Field of Search 128/92 Z, 92 ZY, 92 ZK, 128/92 ZW, 92 ZZ

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Primary Examiner—Robert A. Hafer
Assistant Examiner—Kevin G. Rooney
Attorney, Agent, or Firm—Herbert Dubno

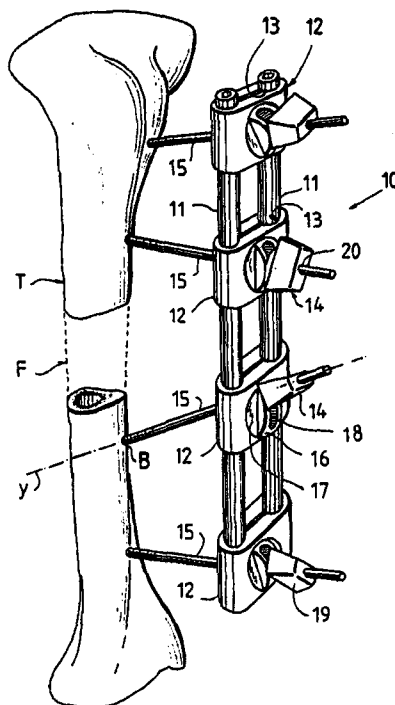
[57] **ABSTRACT**

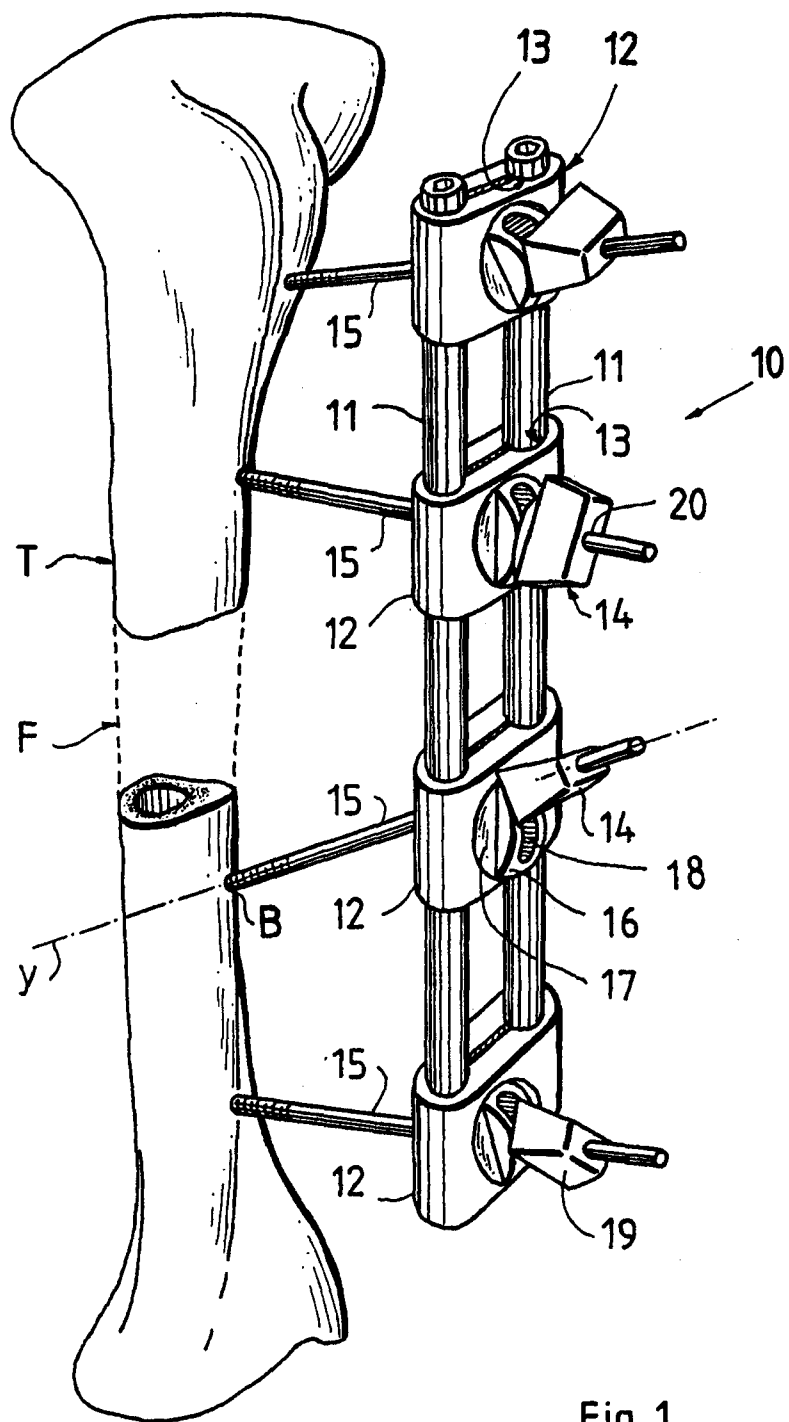
Any external fixture for bone synthesis is provided with at least one bridge member, a plurality of holders are orientable and screw clampable on this bridge member by clamping surfaces. The holders have cylindrical holder openings which are closable by an operating screw and thereby serve as clamp holders, each for one bone nail and/or one bone screw.

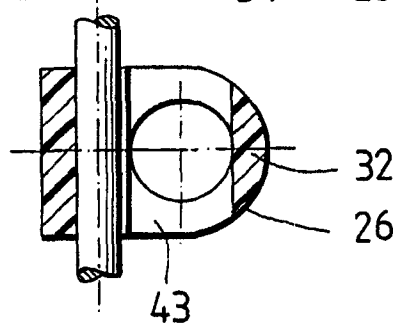
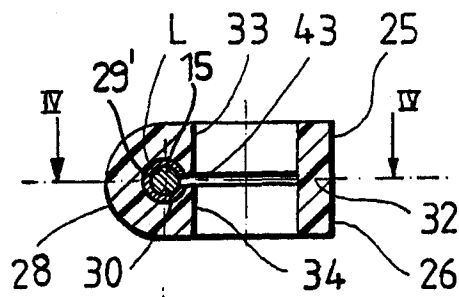
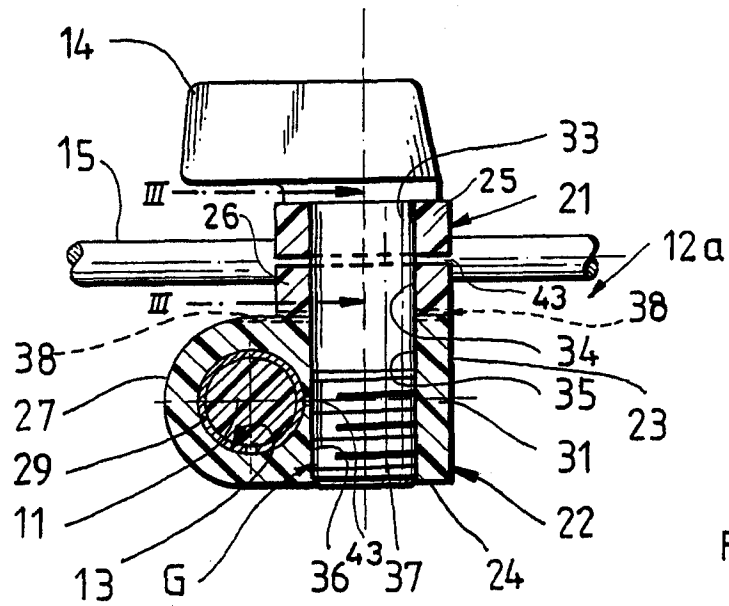
The cylindrical holder openings are bounded by a one piece connected wall surface and are closable individual or jointly with adjacent holder clamp jaw surfaces on the clamp side, on tightening the operating screw. Thus the cylindrical holder openings are each elastically or plastically deformable by a drill and/or screw guide receiving a bone drill with play, from a layer width - down to a smaller width for clamping.

The external fixture affords a simple structure, easy to manufacture and at the same time simple handling during operation.

7 Claims, 10 Drawing Sheets







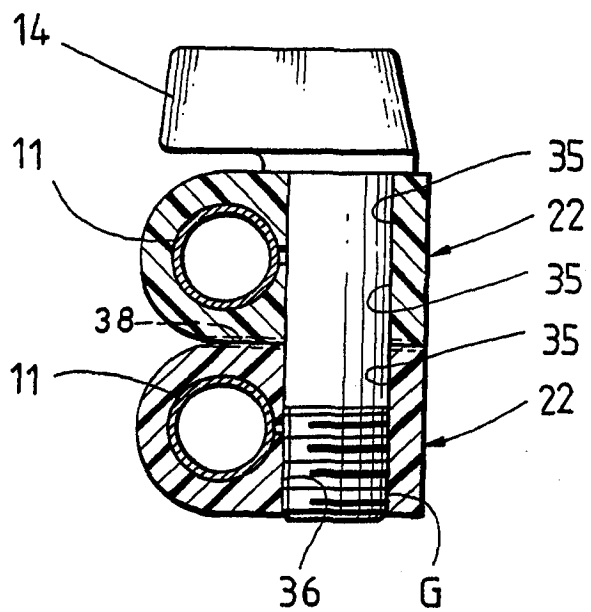


Fig. 5

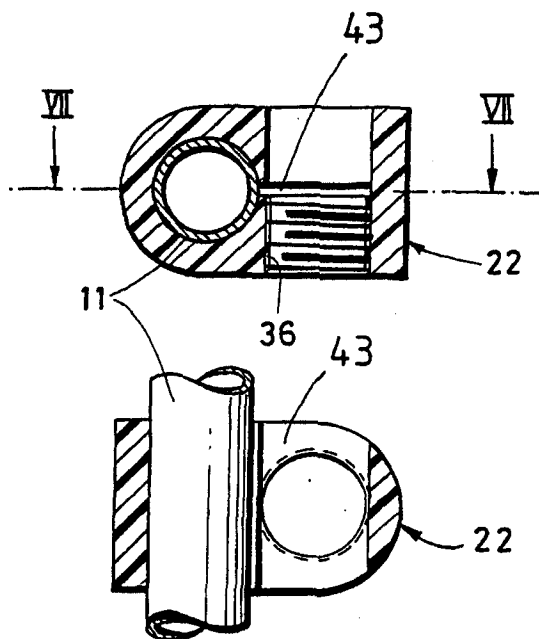


Fig. 6

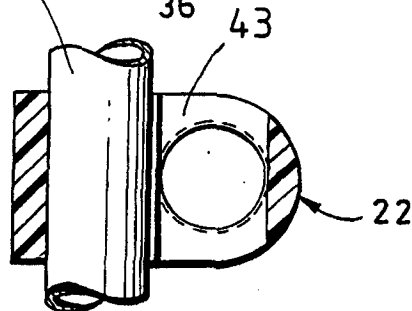


Fig. 7

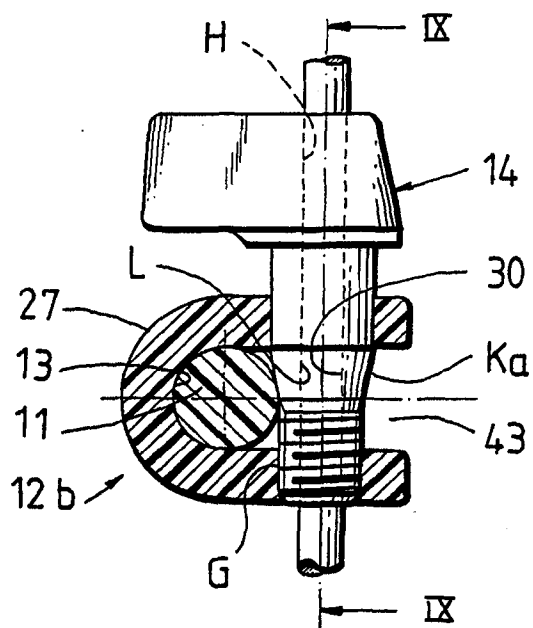


Fig. 8

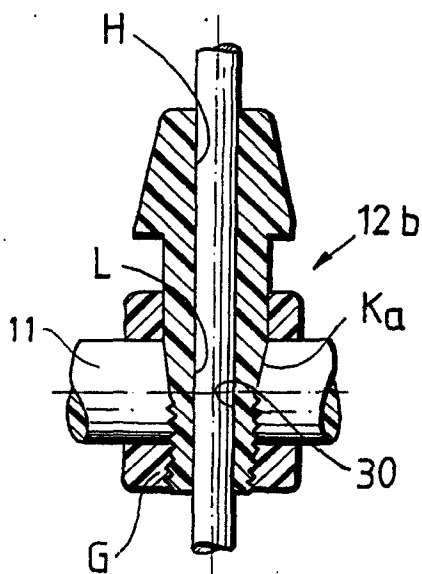


Fig. 9

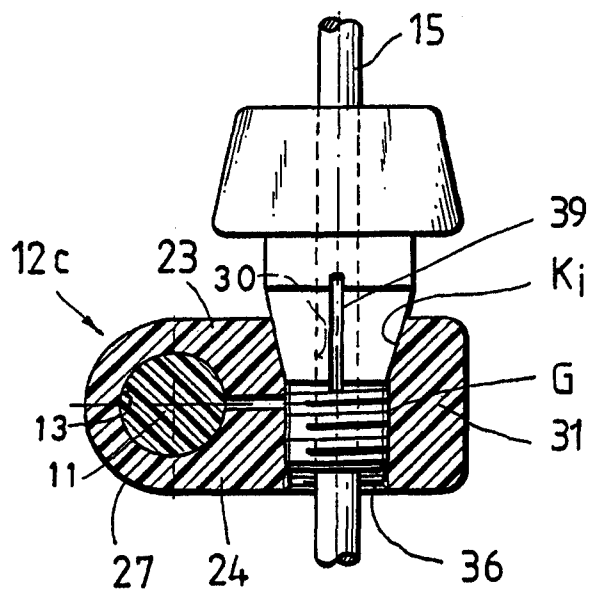


Fig.10

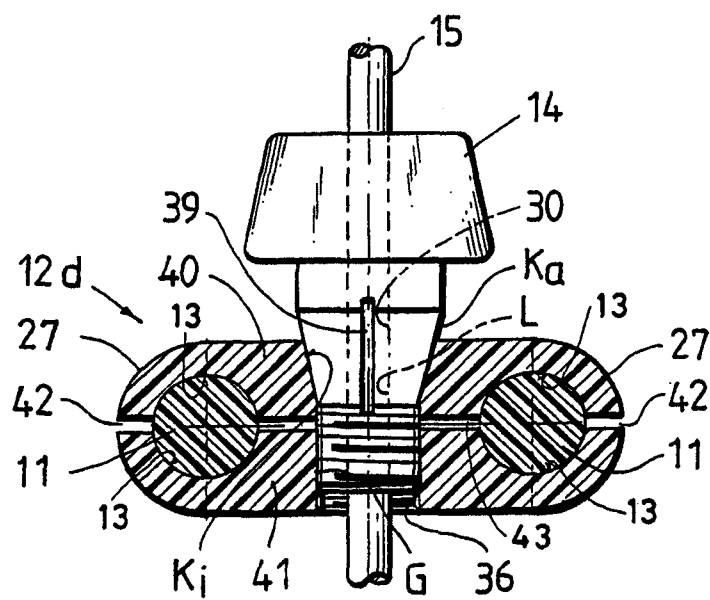


Fig.11

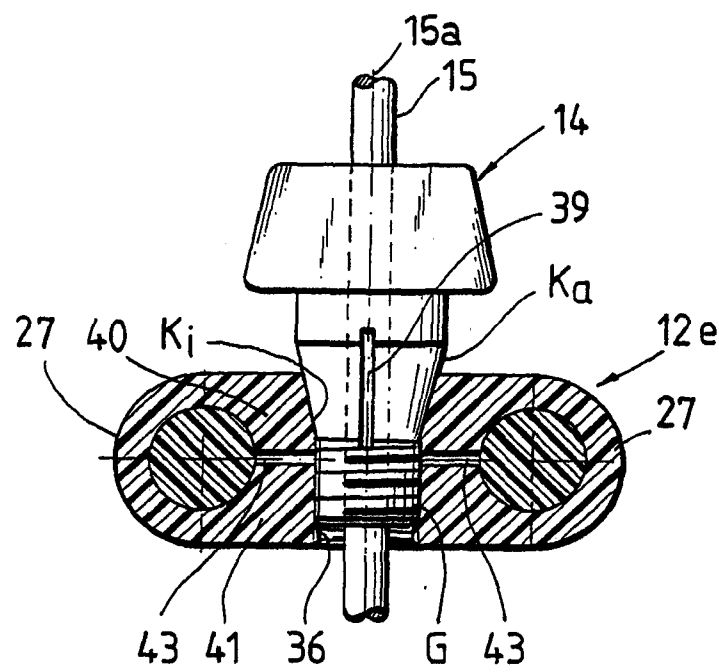


Fig. 12

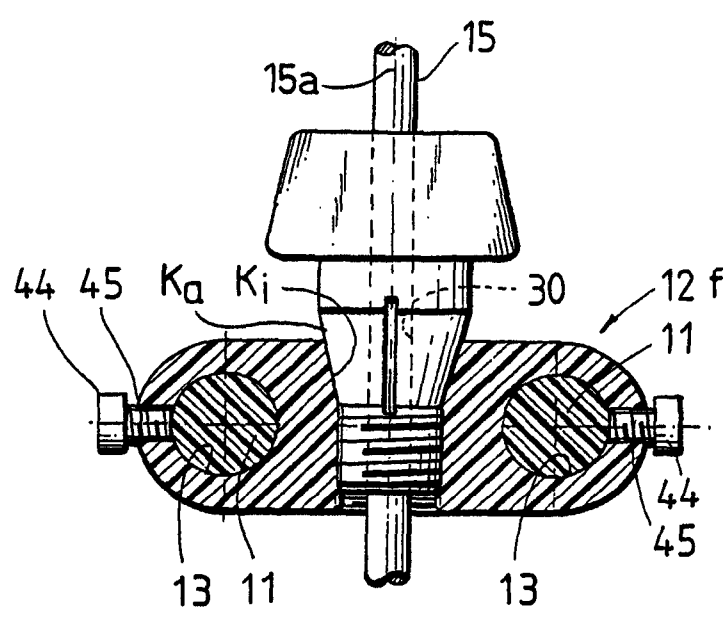


Fig. 13

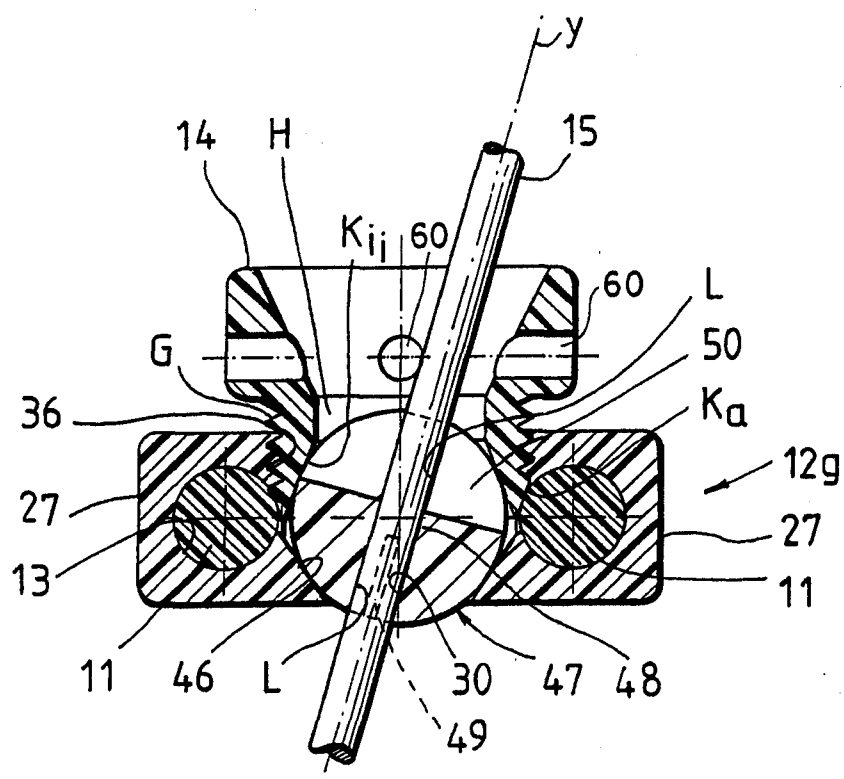
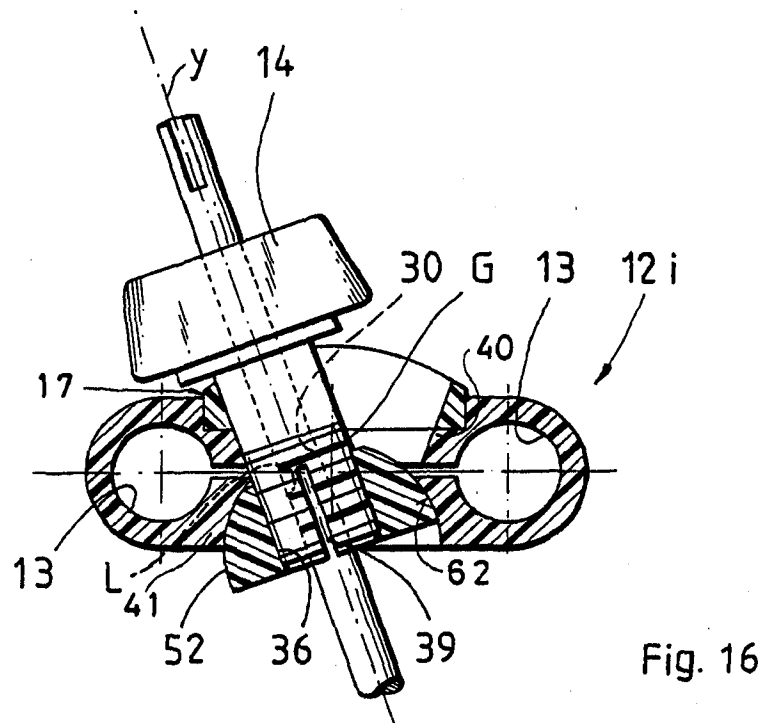
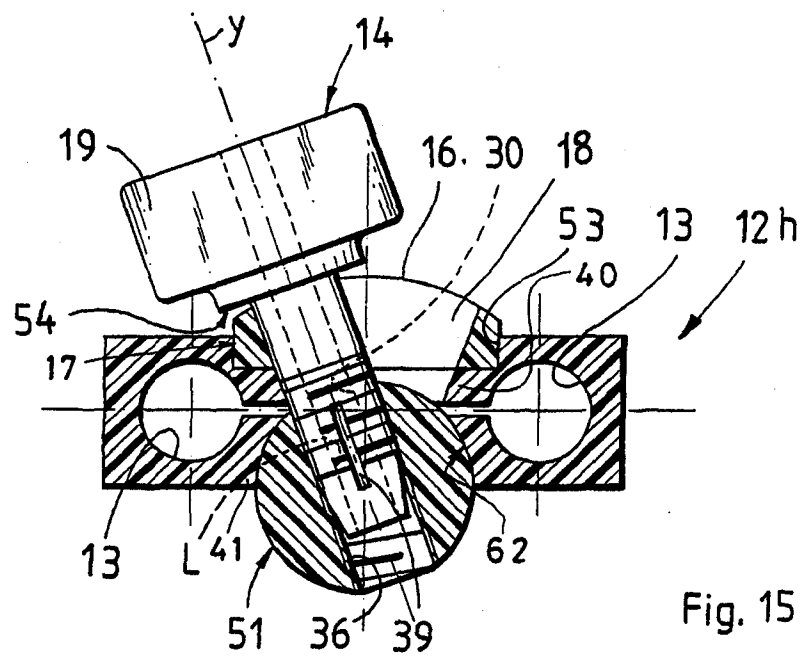
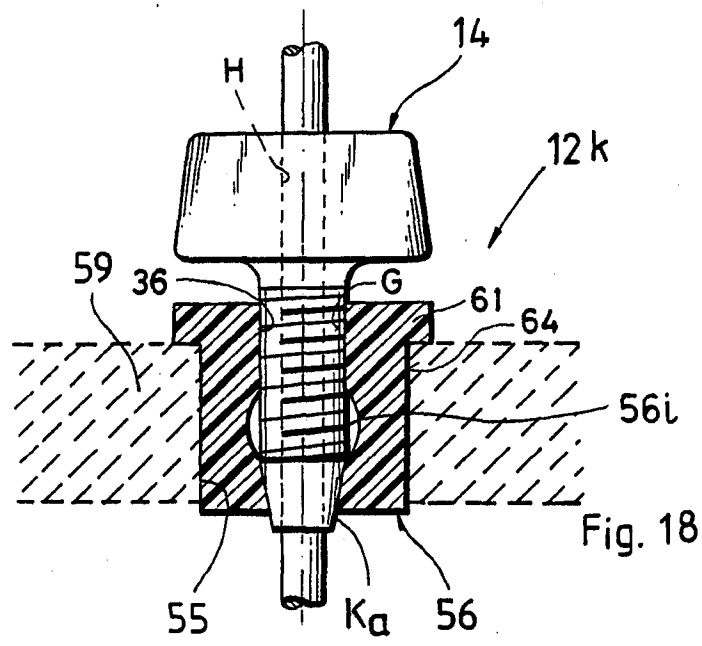
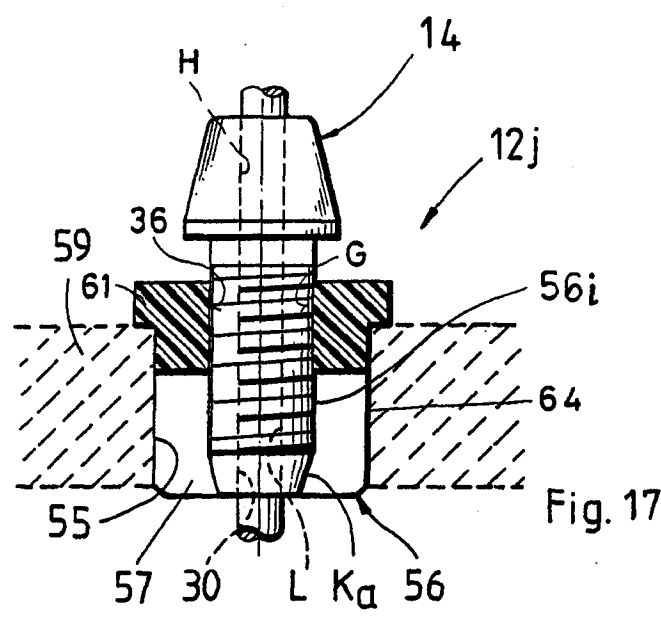
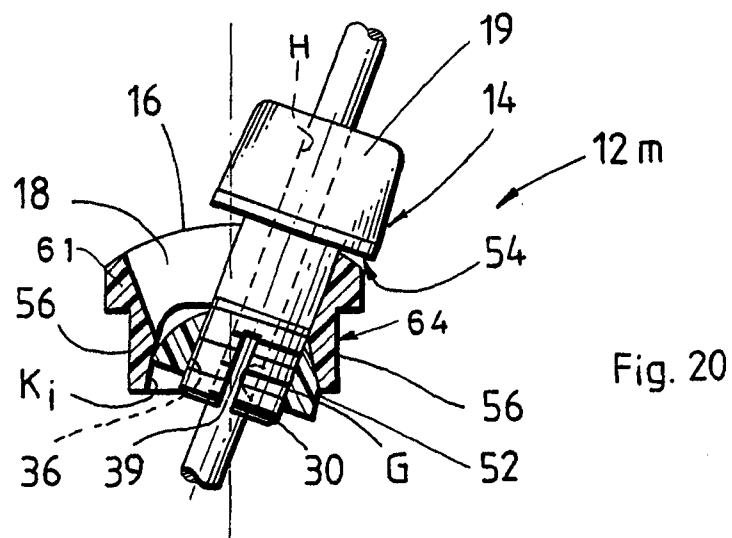
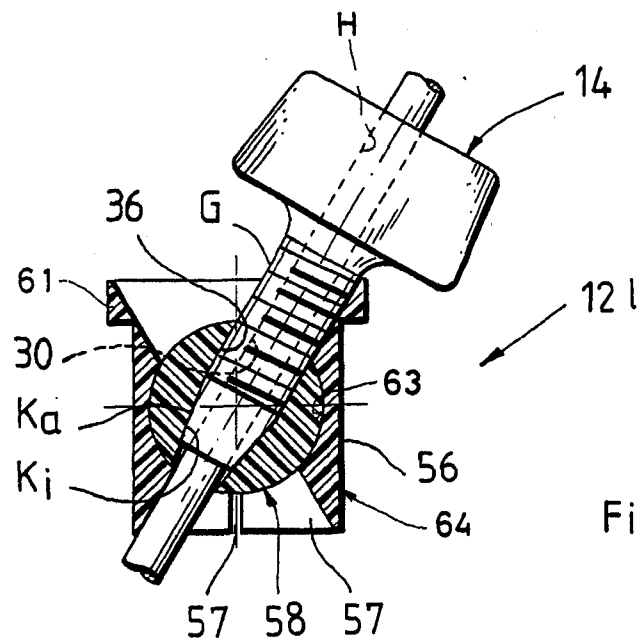


Fig. 14







EXTERNAL FIXTURE FOR OSTEOSYNTHESIS

CROSS REFERENCE TO RELATED APPLICATIONS

This application is a national phase of PCT/DE 87/00146 filed Apr. 6, 1987 and based, in turn, upon German national application No. P 36 11 319.0 of Apr. 4, 1986 under the International Convention.

FIELD OF THE INVENTION

Our present invention relates to an external fixture for osteosynthesis and, more particularly, to a fixture with at least one bridge member on which several holders are orientable and screw-tightenable by means of clamping jaw surfaces, which in turn have cylindrical holder openings closable by operating screws and thereby serve as clamp holders each for one bone nail or screw.

BACKGROUND OF THE INVENTION

The book "Current Concepts of External Fixation of Fractures", by Uthoff and Stahl, Springer-Verlag, Berlin Heidelberg N.Y., 1982, pp. 99-102 describes earlier fixtures for osteosynthesis.

The previously known external fixture contains two approximately circular cylindrical steel disks of the same circumference traversed coaxially by a common clamp screw. In the space between both clamping disks a thin friction disk can be provided. A clamping disk of the clamping disk pair has two secantial and cylindrical passages extending parallel to each other for receiving the bridge members (fixture frame rods) which penetrate the radial circular surfaces facing the neighboring clamping disk. Two receiving passages longitudinally slotted over a comparatively large peripheral region thus result, in which the fixture frame rods projecting from one side alongside the longitudinal slots must be pushed in axially.

The cylindrical holder openings for receiving either a bone nail (e.g. a Steinmann nail) or a bone screw (e.g. a Schanze screw) are formed in the previously known fixture analogous to the described cylindrical passages for the fixture frame rods as cylindrical passages longitudinally slotted along one side.

Clamping of a fixture frame rod and a bone screw is effected in the known external fixture therefore jointly by tightening the central clamping screw so that both clamping disks are pressed against each other axially with their circular front surfaces facing and, the peripheral portions of the fixture frame rod and the bone screw protruding from the longitudinal slot of the receiving passages are clamped between them.

The external fixtures described by the book "Current Concepts of External Fixation of Fractures", differs significantly from the earlier fixtures and this device offers the advantage of a simple structure including fewer components, however, this device requires improvement with regard to its handling during operation and the subsequent care of the patient.

OBJECT OF THE INVENTION

Departing from the fixture described in the book "Current Concepts of External Fixation of Fractures", it is the object of the invention to improve the heretofore known external fixture operationally, by preserving its advantageously simple structure.

SUMMARY OF THE INVENTION

As opposed to the afore-mentioned known external fixture described in "Current Concepts of External

5 Fixation of Fractures" each cylindrical holder opening consists of a single connected wall surface which is deformable elastically or plastically by operation of a screw element to such an extent that the cylindrical holder opening acts as a drill or screw guide and-after progressively closing and/or constricting it—for clamping a bone nail and/or for the bone screw. According to the invention it is basically possible to close the cylindrical holder opening separately or—analogous to the known fixture—jointly with adjacent clamp jaw surfaces which receive the bridge member (particularly the fixture frame rod).

According to that, the first possibility of such an alternative the cylindrical holder openings are closable on tightening the operating screw by elastic or plastic deformation relative to the bridging member or component first in the sense of an preadjustment and then are deformable with the bone nail and/or with the bone screw with an additional closure stroke from position in which the opening or passage forms a drill and/or screw guide until the passage reaches its final clamped configuration.

In a further embodiment, the second possibility of such an alternative construction, the cylindrical holder openings are closable on tightening the operating screws jointly with the adjacent lateral holder clamp jaw surfaces by elastic or plastic deformation first in the sense of a preadjustment, (with respect to the bridge member) and the cylindrical holder openings then are deformable with the bone nail and/or with the bone screw with an additional closure stroke also closing the clamping surfaces from a drill and/or screw guide position to their final clamped configuration.

A preferred embodiment of the invention, affording particularly advantageous handling in practice, has a cylindrical holder—if necessary jointly with adjacent clamp jaw surfaces—preadjusted by partial closing of the operating screw. This means that the holder on the bridge member (e.g. on a fixture frame rod) is held in place substantially unslidably and the cylindrical holder opening is positioned unadjustably relative to the bridge member and/or in regard to the holder supporting it. For example a bone drill (subsequently, if necessary, a screw tap) can thereby be inserted through the cylindrical holder opening. After removal of the bone drill or tap a bone screw and/or a bone nail (the latter as an implant) can be inserted. As soon as the bone nail and/or the bone screw is mounted through the cylindrical holder opening and is in the bone in its final position, the balance of the closing of the cylindrical holder for clamping can be effected.

From the above disclosure it is apparent that the fixture according to our invention is operationally substantially simpler than earlier devices.

According to the invention an external fixture is particularly advantageous when both the cylindrical holder opening or passage (for successively receiving a drill and a bone screw or a bone nail) and also the clamp jaw surfaces of the associated holder can be operated by a single operating screw and of course brought from the preadjusted configuration to the final clamped configuration. To simplify the operation the operating screw can therefore be a prismatic-head screw provided with manually operable large handling surfaces. An elastic or

plastic deformation of the cylindrical holder opening—for example jointly with the adjacent clamp jaw surfaces for the bridge member—is allowed advantageously when the components concerned with the closing are made of a suitable plastic.

Such a plastic can be processed in an injection mold and can contain carbon or glass fiber reinforcement. The use of plastic material—possibly also for the bridge member—gives, aside from a light structure and a simple and economical manufacture, valuable X-ray transparency which does not result with the usual metal external fixtures.

BRIEF DESCRIPTION OF THE DRAWING

In the drawing preferred embodiments of the invention are shown in detail:

FIG. 1 is a perspective view of an external lateral clamping or monofixture shown connected to the tibia for remote fracture repair;

FIG. 2 is a cross sectional view of a two member holder of the external fixture one member of which receives a bone screw and whose other member receives a fixture frame rod;

FIG. 3 is a cross sectional view taken along the section line III—III of FIG. 2,

FIG. 4 is a cross sectional view taken along the section line IV—IV in FIG. 3;

FIG. 5 is a view similar to FIG. 2 which shows an embodiment in which two fixture frame rods cooperate;

FIG. 6 is a detail sectional view through the lower clamp member of the device of FIG. 5 without the operating screw and without the fixture frame rod;

FIG. 7 is a cross sectional view taken along the section line VII—VII in FIG. 6;

FIG. 8 is another view similar to FIG. 2 but which shows another embodiment provided with a clamp member in which both a bone nail and a fixture frame rod can be secured directly by a single operating screw;

FIG. 9 is a cross sectional view taken along the section line IX—IX in FIG. 8;

FIG. 10 shows a simple clamp member in a view analogous to the representation in FIG. 8 in which however the clamping of the fixture frame rod occurs indirectly;

FIG. 11 is a cross sectional view which shows a holder with two clamp members which is approximately the twin of the unit shown in FIG. 10;

FIG. 12 is a view similar to that of FIG. 11 in which both clamp jaw regions of twin clamp members are slotted;

FIG. 13 is another cross section which shows an embodiment similar to FIG. 12 in which a securing of the holder to the fixture frame rod which is separate from the securing of the bone screw (inside of the operating screw) is possible;

FIG. 14 is a similar view which shows an embodiment with twin clamp members analogous to FIG. 12 with space pivotal positioning and securing of a bone screw and the advantage of a direct securing of both fixture frame rods by the operating screw;

FIGS. 15 and 16 shows additional embodiments of the clamp members of our invention analogous to that according to FIG. 14 and in corresponding cross sectional views; and

FIGS. 17 to 20 are sectional views which show plug like holders used with substantially plate and/or honey-combed like bridge members.

SPECIFIC DESCRIPTION

A complete external fixture 10 according to our invention is shown in FIG. 1. The external fixture is shown in this embodiment with a tibia T in which a remote bone repair is taking place in a fracture region F.

Moreover the fixture 10 has two fixture frame rods 11 which are clamped securely in four holders 12. Each holder 12 is provided with clamping surfaces 13 for receipt of the fixture frame rods 11.

The engagement of the clamping surfaces 13 with the fixture frame rods 11 is caused by operating screws 14. By tightening the operating screws 14 cylindrical holder openings not seen in FIG. 1 are closed to secure the bone screw 15 (e.g. so-called S change screws) received in each of them.

Components for receiving the bone screws 15 are provided as shown in FIGS. 15 and 16. Washers 17 which assist in the spatial orientation of the bone screws 15 are part of these components. The rotatable washers 17 are each provided with an elongated hole 18 in the vicinity of its spherical surface 16 for receipt of the screw shaft of the operating screw 14 which can recline the bone screw 15.

The practical manipulation of the external fixture shown in FIG. 1 is as follows:

The relative positioning of the holder 12 on the bridge member (fixture frame rods 11) is caused by partially tightening the related operating screw 14 with its operating lever 19. Moreover the longitudinal axis y of each operating screw 14 is secured in the desired spatial position by this partial tightening.

A bone drill is then axially fed through the front opening 20 (which extends into the cylindrical holder) of the associated operating screw 14 and the bone drill B is introduced into the tibia T. A screw tap is inserted through the opening 20 of the operating screw 14 after removal of the bone drill and provides the bone hole B with an interior thread. The bone screw 15 is inserted through the opening 20 of the operating screw 14 after withdrawing the bone-tap drill. After the bone screw 15 has reached its final attachment position in the threaded bone hole B the associated operating screw is tightened manually by operating screw handle 19. Because of that both the holder 12 on the associated fixture frame rods 11, the bone screw 15 inside the operating screw 14 and also finally the pivot system (of which only the washer 17 is shown in FIG. 1) are fixed rigidly in position relative to the fixture frame rod 11.

With the aid of the arrangement according to FIG. 1, it can be easily imagined that the structural components shown there can also be used for installation of a fixture frame or a fixture framework. Thus additional holders 12 (not shown) are clamped on one end on both fixture frame rods 11 and act as coupling members for respective laterally adjacent fixture frame rods 11. In this way holders 12 (with operating screws 14) for holding Steinmann nails are positioned diametrically opposing each other on opposite sides of the tibia T. The use of the fixture 10, if desirable also pivotally mounted, is understandably not limited to a tibia T but advantageously also to other extremities and to the pelvis.

In the embodiment of our invention according to FIGS. 2-4 the twin holders 12 have two clamp members 21 and 22.

Each clamp member 21, 22 has two clamping arms 23, 24 and 25, 26 respectively parallel to each other. The

two clamping arms 23, 24 and/or 25, 26 are attached to one another by a slotted tube section 27, 28.

The slotted tube section 27 of the clamp member 22 forms the clamp jaw surface 13 for the fixture frame rod 11 made of carbon fiber reinforced plastic material. For the case in which fixture frame rods 11 with diameter variations are used a fitting sleeve 29 is inserted on the clamp jaw surface 13 for compensation of undersize fixture frame rods. The fitting sleeve 29 thus forms a circumferentially variable fitting sleeve.

The other clamp member 21 contains the cylindrical holder opening 30 for receiving the bone screw 15.

A feature of both clamp members 21 and 22 having only one slotted tube section 27 and/or 28 on one end is that their clamping arms 23, 24; 25, 26 are connected with each other in one piece by connecting bridges 31, 32 respectively. The connecting bridges 31, 32 result in definite clamping characteristics.

Of the four successively positioned clamping arms 23, 24; 25, 26 three clamping arms 25, 26 and 23 each have smooth interior passages 33, 34, 35 and the remaining clamping arm 24 has an interiorly threaded passage 36 for the threaded part 37 of the common operating screw 14 which does not by itself form the cylindrical holder opening 30 according to FIGS. 2-4.

Both the clamp jaw surfaces 13 and the cylindrical holder passage 30 are jointly operated by the operating screw 14 in the embodiment according to FIGS. 2 to 4. As has already been illustrated in conjunction with FIG. 1 the securing of the holder 12 relative to the fixture frame rods 11 and the bone screw 15 and/or in regard to an unshown drill is possible. First an additional tightening of the operating screw 14 causes a common final clamping of the fixture frame rod 11 in regard to the clamp jaw surface 13 and/or in regard to the slotted sleeve 29 and of the bone screw 15 in regard to the cylindrical holder opening 30.

To secure the relative rotational position of the clamp members 21, 22 to each other planar grooved serrations 38, i.e. so-called "Hirth serrations", are provided on the contacting surfaces facing each other.

In the embodiment of FIGS. 5-7 two substantially identical clamp members 22, 22 are provided each having a smooth passage 35 while the lower of the two clamp members has an interior threaded passage 36. The clamping of both clamp members 22, 22 which each receive a tube like fixture frame rod 11 occurs analogous to the clamping occurring in the embodiment provided in FIGS. 2-4. A cylindrical holder opening 30 is not shown in the embodiment of FIGS. 5-7, because the operating screw 14 contains a cylindrical holder opening 30, substantially similar to the operating screw 14 according to FIG. 8.

In the embodiment of FIGS. 8 and 9 the operating screw 14 is traversed by an axial passage H which contains the wall surface L forming the cylindrical holder opening 30. Above the outer threaded portion G of the operating screw 14 there is an exterior cone K_a . This outer cone K_a is located substantially upwardly from the threaded portion G on the axis of the cylindrical holder opening 30. When the operating screw 14 is tightened, the outer cone K_a contacts increasingly on the outer surface of the fixture frame rod 11 whereby the outer surface of the fixture frame rod 11 is pushed against the clamping surface 13 of the slotted tube section 27. On the interior of the outer cone K_a alone—and thus the wall surface L—is deformed elastically in the sense of a narrowing. It remains to be noted that the

operating screw 14 and the clamp member holder 12b (like the similar components in the foregoing and following FIGURES) are made from an entropically elastically deformable plastic and of course as an injection molded components. A plastic material including fiber components, especially carbon and glass fibers, is used.

In the embodiments of FIGS. 10-13 the operating screw 14 has the holders 12c, 12d, 12e and 12f with essentially the same structure. The outer cone K_a of the operating screw 14 is provided with at least two clamping slots 39 which should easily allow a narrowing of the cylindrical holder opening 30 with the wall surface L on tightening the operating screw 14.

As a resistive surface and/or stop member for the outer cone K_a the upper clamp member 23 and/or 40 has a conical opening K_i (inner cone) correlated to the outer cone K_a . The lower clamp member 24 and/or 41 is provided with the inner thread 36 for receiving the outer thread G. Hence the clamp members 23, 24; 40, 41 (with their clamping surfaces 13) are simultaneously closed on the cylindrical holder openings.

The embodiment shown in FIGS. 11-12 is different only in so far as FIGS. 11 and 12 show a twin clamp member arrangement for receipt of two fixture frame rods 11 while only a single clamp member 12d is shown in FIG. 10. The embodiment of FIG. 11 has on the contrary a slotted tube section longitudinally divided by axial slots 42 so that in this case two approximately shell shape clamping components with the clamping arms 40, 41 and the divided slot tube region 27 result.

In the embodiment of FIG. 10 only the simple member or clip 12d with the undivided slotted tube section 27 and a connecting bridge 31 between both clamp members 23, 24 is provided.

The embodiment of FIG. 13 differs from that of FIG. 12 only in that it has no slot 43 to define a slotted tube section 27. Furthermore the holder component 12f forms clamp jaw openings 13 which provide a securing of the fixture frame rods 11 by, for embodiment, specially threaded pins 45 provided with a clamp handle or knob 44. The clamping of the bone screw 15 inside of the cylindrical opening occurs by the press-cone arrangement K_a and K_i similar to the embodiment of FIG. 12.

The embodiment of FIG. 14 with the holder 12g forms a variation of the embodiment of FIG. 12, however with the advantage of a space pivot orientability and securing the cylindrical holder opening 30 with its wall surface L. The advantage of a simultaneous direct clamping of both fixture frame rods 11 by the operating screw 14 is obtained. Of course a holder-side spherical ball socket 46 is provided in the holder 12g in which a clamping ball 47 is space pivotally mounted. The clamping ball 47 made of a suitable plastic material has a radially running lower slot 49 and a slotted hole, slot or cavity 50 facilitating displacement approximately 90° with a solid intermediate material between them. The clamp slots or cavities 49, 50 should make the closability in the vicinity of the wall surface of the cylindrical holder opening 30 easier. This closability occurs in this embodiment of FIG. 14 as follows:

The operating screw 14 provided with an axial hollow space H has an inner cone K_{ii} on its free end which presses from the outside against the clamping ball 47 while the operating screw 14 is tightened. On the free end of the outer thread G of the operating screw 14 an outer cone K_a is found which presses against the outer surface of the fixture frame rods 11. In this way in the

embodiment of FIG. 14 a clamping of the bone screw 15—also in the sense of a preadjustment—inside of the cylindrical holder opening 30 and also a holding of the fixture frame rods in place occurs inside of the clamp jaw surfaces 13.

The screw head of the operating screw 14 is provided with an insertion opening 60 for the tool to be inserted.

In FIGS. 15 and 16 the holders 12_h and 12_i related structurally to each other are shown.

Also in the embodiments of FIGS. 15 and 16 the screw axis y is pivotally orientable in space, i.e. can be swiveled, and fixable. The here-provided clamping ball 51 (FIG. 15) or the clamping ball 52 (FIG. 16) can be formed as threaded members. The specially threaded members 51, 52 are provided with an interior thread 36 for receipt of the exteriorly threaded member G of the operating screw 14. So that a narrowing of the cylindrical holder opening 30 with the operating screw 14 receiving the wall surface L can occur the threaded portion G has a clamping slot 39 in the axial longitudinal portion of the wall surface L. For the case in which greater clamping force must be applied the ball 51 is provided while a hemispherical ball 52 suffices for lower clamping force (small axial length of the threads 36).

For receiving the ball 51 resp. the hemispherical ball 52 each clamp member 41 is provided with a spherical ball socket 62.

The washer 17 already mentioned in connection with FIG. 1 with their spherical surface 16 is shown in detail in FIGS. 15 and 16. The washer 17 has a circular cylindrical basic form and is positioned rotatably in a circular cylindrical recess 53. For pivotability of the shaft of the screw 14 the elongated hole (pivot opening) 18 is provided. The spherical surface 16 forms therefore the bearing surface for the lower side of the screw head 19. Also in the embodiment of FIGS. 15 and 16 a combined adjustment—also in the sense of a preadjustment—of the cylindrical holder opening 30 of the threaded members 51 resp. 52 and the unshown fixture frame rods 11 inside the clamp jaw surfaces 13 is possible.

FIGS. 17-20 show a stopperlike insert 61 provided with contacting surfaces in the holders 12j-12m for each receiving opening 55 (not shown in FIGS. 19 and 20) of a plate like and/or honeycomb like bridge member 59 made of a plastic transparent to X-ray radiation.

Each stopperlike insert 12j-12m with inner threads 36 forms a spreading body 56 with outer clamp jaw surfaces 64 which is pressed against the wall of the receiving opening 55 on tightening the operating screw 14, preferably, facilitated by the clamping slot 57. Thus the operating screw 14 with the threaded section G is provided with an outer cone K_a of FIG. 17 which moreover causes a deformation of the cylindrical holder opening 30 with its wall L. The same principle is followed in the embodiment of FIG. 18.

As can be seen from FIG. 19 a roller like threaded member 58 is provided with an inner thread 36 for the outer thread member G of the operating screw 14 inside of a circular cylindrical bearing socket 63 of the insert 12l. The roller 58 has an inner cone K_i against which the outer cone K_a of the operating screw 14 contacts causing both the elastic deformation of the clamping roller 58, a narrowing of the cylindrical holder opening 30 and a spreading of the spreading body 56.

In the embodiment of FIG. 20 the holder 12m formed as a special threaded member has a hemispherical clamping ball 52 with the inner thread 36 for the outer

thread G of the operating screw 14 which can contact against the inner surface of the elastically deformed spreading body 56 which forms an inner cone K_i of the components closing it. Similar to the embodiment of FIGS. 15 and 16 an elongated hole like pivot opening 18 of the upper portion of the component supporting the spreading body 56 has an elongated pivot opening 18 which is enclosed by a spherical surface 16 as a bearing surface for the underside 54 of the screw head 19. Also the threaded member G is provided in the axial longitudinal region of the cylindrical holder opening 30 with a clamping slot 39.

In all stopperlike embodiments of FIGS. 17-20 the movability of the components 58, 59 is or completed by the rotatability of the insert 12l, 12m in the cylindrical receptacle 55 of the honeycomb and/or plate like bridge member 59 complementing the space pivotability.

We claim:

1. An external fixture for securing bone parts for osteosynthesis, comprising:

a support having two spaced-apart parallel rods;

a plurality of holders secured to said rods, each of said holders comprising:

clamping means formed by a one-piece body constituting a sleeve having a slit defining two juxtaposed clamping surfaces flanking said rods from opposite sides thereof and on opposite sides of said sleeve and formed with respective generally cylindrically segmental cavities receiving the respective rods whereby said rods are clamped between said clamping surfaces, when said members are drawn toward one another, said clamping surfaces on opposite sides of the sleeve being formed with mutually registering holes,

an operating screw having a head engageable by a user to rotate said screw and a screwthread, said screw passing through said holes and being rotatable to draw said clamping surfaces toward one another and clamp said clamping surfaces against said rods, said operating screw being formed with an axial bore adapted to constrict upon tightening of said screw,

an internally threaded member engaging the screwthread of said operating screw at an end thereof opposite said head, and

means including said internally threaded member forming a swivel enabling said screw to swing relative to said body in said holes and locking said swivel into a fixed position in said body upon tightening of said screw into said member; and

a respective bone screw or bone nail passing through and received in a respective one of said axial bores in a respective operating screw, clamped in the respective bore upon tightening of the respective operating screw into the respective member and fixed in a respective one of said bone parts at an angular orientation determined by an angle at which the respective swivel is locked in the respective body.

2. The external fixture defined in claim 1 wherein said sleeve is slotted along one side thereof.

3. The external fixture defined in claim 1 wherein said member is received in one of said holes and said swivel further includes a washer having a slot through which said operating screw passes and received rotatably in the other of said holes.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIRECCION DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado
Dr. EMILIO FERRERO.

ASUNTO	Radicación	06 - 105184
	Trámite	011
	Evento	379
	Actuación	430
	Oficio	007224
	Folios	11

Patente de Invención	☒	Patente de Modelo de Utilidad	☐
Vía Nacional	☐		
Vía PCT (fase nacional)	☒	Cap. I	☒
		Cap. II	☐
No. Sol. Internacional	PCT/CH2004/000237		
Fecha de Presentación Internal.	2004/04/19		

Como resultado del examen de fondo, realizado con fundamento en el artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se comunica:

1. Documentos estudiados

<u>Descripción:</u>	Folios: 32 a 39	Como se radico inicialmente.
<u>Reivindicaciones:</u>	Folios: 40 a 44	Como se radico inicialmente.
<u>Dibujos:</u>	Folios: 46 a 50	Como se radico inicialmente.
<u>Prioridad:</u>	Folios:	No presenta prioridad.

2. Objeto de la invención

Titulo de la invención: "ELEMENTO ELASTICO PRODUCIDO DE MATERIAL RADIOBRILLANTE PARA UN DISPOSITIVO MEDICO". (Folio 1).

Problema Técnico Planteado:

- Facilitar la observación de los elementos elásticos como resortes de compresión cilíndricos, cónicos, o helicoidales, que componen un dispositivo medico para la fijación de huesos mediante componentes longitudinales como barras o varillas, cuando se realizan la respectiva toma de rayos X.
- Evitar las sombras que despiden los elementos elásticos que se encuentran fabricados en metal, cuando se van a realizar las tomas de de rayos X.

- Proporcionar un elemento elástico (resortes de compresión) fabricado en material elastomérico o plástico radio brillante, ubicado y en posición para cumplir con sus funciones mecánicas correspondientes dentro de un dispositivo médico para la fijación de huesos, evitando arrojar sombras u oscuridades sobre la imagen de rayos X, cuando es tomada por el profesional concerniente a este campo.

Solución:

- La solución a los problemas técnicos planteados es proporcionar un elemento elástico, con su respectiva configuración constructiva helicoidal con sus extremos aplanados, con una sección transversal de espiral en forma trapezoidal inclinándose hacia la periferia del reverso helicoidal, asimismo este elemento elástico cuenta con otra variación constructiva en forma de cono truncado hueco, este resorte cuenta con una inclinación desde un primer extremo a un segundo extremo la cual tiene varias muescas aserradas la cual están distribuidas sobre su periferia en su primer extremo. Este elemento elástico está fabricado en material elastomérico o plástico radioluminiscente que no ha sido reforzado con el fin de identificarlo dentro del dispositivo médico empleado para la fijación de huesos, cuando se van a realizar las tomas de rayos X.

IPC: A61B17/64, A61B17/60, A61L32/06, A61L31/04, A61L31/14.

3. Análisis de la solicitud de Patente

Reivindicaciones (artículo 30 D 486, Art 22 PCT).

Claridad:

- En la reivindicación independiente No.1, se evidencia que el elemento llamado "*elemento elástico (1)*", a pesar de que muestra su número de referencia designado, la descripción de esta característica es muy ambigua y general, debido a que a varios elementos mecánicos que tienen la propiedad de ser elásticos dependiendo su empleo y funcionalidad.

Se le sugiere al solicitante presentar una nueva reivindicación independiente No.1, colocando de manera clara y concreta a cual elemento elástico en específico de la invención se está refiriendo, por ejemplo resorte, abrazadera, resorte plano, resorte cónico, etc., con el fin de comprender mejor la invención al momento de hacer el análisis y distinguir los elementos de dicha reivindicación.

Se le sugiere al solicitante presentar una nueva reivindicación independiente No.1, que contenga en el preámbulo los elementos conocidos en el estado de la técnica y en la parte caracterizadora presentar los elementos y/o características novedosas que lo hacen diferente del estado de la técnica.

Se le recuerda al solicitante que en la reivindicación independiente, la parte caracterizadora, que suele seguir al preámbulo precedida por la frase "**caracterizado por**", recoge las características técnicas que van hacer

protegidas y que constituyen la novedad frente al objeto conocido del estado de la técnica.

- En las reivindicaciones dependientes No.3, 4, 5 y 14, se evidencia que no son claras, ni coherentes, debido a que lo que se está ilustrando son las características técnicas particulares del material plástico o elastomérico radioluminiscente en que está hecho o fabricado "*el elemento elástico (1)*", es decir, que lo que se quiere reivindicar y proteger son las características del material por medio del "*elemento elástico (1)*", evidenciándose que no se están ilustrando las características técnicas particulares como tal de "*elemento elástico (1)*".

Se le sugiere al solicitante que suprima o elimine estas reivindicaciones.

- En la reivindicación dependiente No.11, se evidencia que su preámbulo se encuentra mal formulado y mal redactado.

Se le sugiere al solicitante que formule y redacte nuevamente esta reivindicación colocando de manera correcta su preámbulo, como por ejemplo "*elemento elástico de la reivindicación No.1*".

- En las reivindicaciones dependientes No.12 y No.13, se evidencia, que no son claras, coherentes y entendibles, debido a que lo que se está ilustrando son las características técnicas particulares de un dispositivo médico que no están contenidas, ni se encuentran, ni se enseñan en la reivindicación independiente No.1 junto con sus dependientes 2 a 11 presentando falsa dependencia, al mismo tiempo se observa que lo que se quiere es reivindicar, fusionar y proteger son las características del dispositivo médico para la fijación de huesos por medio del "*elemento elástico (1)*", además sus preámbulos se encuentran mal formulados y mal redactados.

Se le sugiere al solicitante que suprima o elimine estas reivindicaciones.

- En la reivindicación No.15, se evidencia que no es clara, coherente y entendible, debido a que según como está reivindicada, su preámbulo se refiere a unas características que se ilustran en las reivindicaciones dependientes No.13 y No.14, las cuales dependen de la reivindicación independiente No.1, originando confusión, debido que no se sabe si es una reivindicación dependiente o independiente.

A pesar de que el contenido de esta reivindicación No.15 se encuentra soportado en la descripción, se evidencia que no hay coherencia debido a que el objeto de la invención es "*elemento elástico (1)*" y no el dispositivo médico en donde va insertado dicho "*elemento elástico (1)*", en esta reivindicación lo que se está ilustrando, es cada una de las características técnicas esenciales y particulares que componen el dispositivo médico.

Se le sugiere al solicitante que defina si esta reivindicación es independiente o dependiente, teniendo en cuenta las anteriores falencias que se evidenciaron, asimismo se debe tener en cuenta que el objeto de la invención es "*elemento elástico (1)*" y no "*el dispositivo médico*", en el caso de que el solicitante definiera que esta reivindicación llegara a ser independiente.

- En los siguientes grupos de reivindicaciones independientes y dependientes, se evidencia que ilustran elementos, características, componentes o términos, que no son claros, no se definen de manera específica y concreta a que elementos se están refiriendo y/o cuales elementos pertenecen, así:
 - No.1. "Elemento elástico", "Resorte",
 - No.12. "Elemento elástico", "Componentes restantes".
 - No.12. "Dispositivo".
 - No.13. "Abrazadera", "Medios de fijación de hueso".
 - No.13 y No15. "Componentes longitudinales".
 - No.15. "Dos dispositivos", "eje de rotación".
 - No.18. "Lasa".

Se le sugiere al solicitante que coloque de manera específica y concreta a que elementos, características, componentes o términos, se esta refiriendo, colocando al frente de la característica o del elemento, el numero de referencia guardando correspondencia con el capitulo descriptivo, las graficas o dibujos y dicho capitulo reivindicatorio, con el objetivo de comprender mejor la invención al momento de hacer el análisis y distinguir los elementos de dicha invención.

- En las reivindicaciones dependientes No.16 a 21, se evidencia que están definiendo todas las características particulares del dispositivo medico, pero no esta se esta ilustrando en ningún momento las características técnicas particulares del *"elemento elástico (1)"*.

Se le sugiere al solicitante que elimine o redacte nuevamente estas reivindicaciones, teniendo en cuenta la falencia observada en estas reivindicaciones junto con las falencias ilustradas en la reivindicación No.15.

- En la reivindicación dependiente No.22, se ilustra la característica llamada *"material de yeso (21) se suministra en un extremo del eje (15)"*, se evidencia que esta reivindicación no es clara, debido a que no se sabe como interactúa este material de yeso con el extremo del eje (15), ni tampoco se explica, ni se describe de manera clara, ni aparece soportada en la descripción de la solicitud en estudio, como interactúa estas dos características entre si.

Se le sugiere al solicitante que elimine o suprima esta reivindicación.

4. Determinación del Estado de la Técnica

Teniendo en cuenta la fecha de presentación nacional, con fecha del 18 de Octubre del 2006, se encontraron los siguientes documentos relevantes:

Nº	Documento	Título	Fecha de Publicación
D1	US4920959	EXTERNAL FIXTURE FOR OSTEOSYNTHESIS	01/05/1990

1. Respecto al estado de la técnica:

El documento **D1 US4920959** ilustra un dispositivo para fijación externa de

un hueso junto con un miembro llamado puente, asimismo cuenta con una pluralidad de retenedores o soportes la cual son orientables y con abrazaderas con rosca, la cual se encuentra acoplada ha dicho puente. Los retenedores son aperturas cilíndricas que son elásticamente o plásticamente deformables por un perforado o roscado que guía y recibe el tornillo roscado del hueso con una holgura desde una apertura mayor a una apertura menor de sujeción. Estos soportes están fabricados de material plástico obteniendo una estructura ligera, menos costosa en su fabricación y se pueden ver claramente en las tomas de rayos X. (Ver "Abstract, Hojas 1 a 10" y las "figuras No.1 a No.20").

5. Análisis de Patentabilidad (Art 14 D486):

Novedad (Art 16 D486)

1. Respecto a la solicitud en estudio:

La reivindicación No.1 dice: "Elemento elástico (1) de un material radioluminiscente para un dispositivo medico, caracterizado porque el elemento elástico (1) se hace de material plástico, que no ha sido reforzado". (Ver folio 40).

Para efectos del examen, se toma en cuenta como características técnicas esenciales las que se encuentran subrayadas por el examinador.

2. Análisis de las diferencias con respecto al estado de la técnica:

En la tabla No.1, se ilustran en las casillas de comparación, la explicación de Afirmativa si las reivindicaciones están comprendidas dentro del estado de la técnica (documento D1), en caso contrario se enunciara como No es Afirmativa.

Tabla No.1.

ESTUDIO DE NOVEDAD	
Características esenciales de la Solicitud en estudio	Estado de la Tecnica
	Documento D1
".....el elemento elástico (1) se hace de material plástico, que no ha sido reforzado".	Afirmativa (Ver "Abstract" Columna 2 (lin 59 a 68), Columna 3 (lin 1 a 12), Columna 5 (lin 3 a 18), Columna 5 (lin 65 a 68), Columna 6 (lin 1 a 21), figuras 1 a 20).

3. Realizada la comparación y el análisis del documento D1, mediante la tabla No.1 con respecto a la solicitud en estudio donde se presenta la reivindicación No.1, se evidencia que D1 contiene todas las características esenciales de la reivindicación No.1. Por lo que se concluiría que la reivindicación No.1 de la solicitud en estudio no es nueva y no cumpliría con lo estipulado en el artículo 16 de la decisión 486.

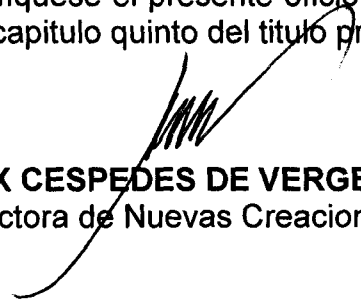
Conclusión:

Los requisitos de patentabilidad de la presente solicitud se encuentran afectados así:

N°	Documento N°	Reivindicaciones Afectadas	Requisito que Afecta
D1	US4920959	1 a 22	Novedad

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta días contados a partir de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2 literal e), del capítulo quinto del título primero de la circular única, No. 10 del 2001.


ALIX CESPEDES DE VERGEL
Directora de Nuevas Creaciones (C)

04 JUN. 2010

El anterior requerimiento fue notificado por fijación en lista, de fecha

CONCEPTO TECNICO Numero: 1552	EXAMINADOR TECNICO Código No. 202072
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A/C