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E. S. D.

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



No. 06-105186-00002-0000

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Tra. 11 PATENTE IYII Lve: 378 FASE NACIONAL I
Act. 538 PETICION Folios: 3

Trámite : 011 Evento : 378 Actuación : 538

Referencia : Expediente No. 06105186
Asunto : Solicitud de patente para DISCO
INTERVERTEBRAL PROTESICO O VERTEBRAL
ARTIFICIAL
Solicitante : SYNTHES GMBH
Publicada en : La Gaceta No. 582 del 30 de noviembre de 2007

SOLICITUD EXAMEN DE PATENTABILIDAD

1. Yo, Emilio FERRERO, identificado como aparece al pie de mi firma, actuando como apoderado de la sociedad SYNTHES GMBH, atentamente solicito se efectúe el examen de patentabilidad de la solicitud en referencia presentada de acuerdo con las reglas del 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 la tasa legal fijada para el efecto según lo dispuesto en la Resolución No. 44372 del 26 de diciembre de 2007.

2. Por lo anterior, comedidamente solicito se prosiga con el trámite de este asunto.

Señora Jefe,

EMILIO FERRERO
T.P.A. No. 31.929

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No. M-2008-126809\SCT

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO

NIT : 800176089-2

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FECHA : MAYO 12 DE 2008

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO DE BOGOTA	062754387	1075023	12/05/2008	73,795,000.00

***** CONCEPTO *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01 SOLICITUDES	114 PTC CAP-II EXAMEN DE PATENTIBILID	210,000.00
TOTAL :			\$ 210,000.00

SON: DOSCIENTOS DIEZ MIL PESOS

RESPONSABLE :

610 15153-841-020-1

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SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO



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CAVELIER ABOGADOS	CONSIGNACION	BANCO DE BOGOTA	062754387	1975023	12/05/2008	73,795,000.00

***** CONCEPTO *****

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		114 PTC CAP-II EXAMEN DE PATENTE (BILID	210,000.00
		TOTAL :	\$ 210,000.00

SON: DOSCIENTOS DIEZ MIL PESOS

RESPONSABLE :

Colo 15113-841-020-1

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DIVISIÓN DE NUEVAS CREACIONES

RADICACIÓN EXPEDIENTE No. 06-105186

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

FUE PUBLICADO EN LA GACETA DE PROPIEDAD INDUSTRIAL No **582** DE

FECHA **30 DE NOVIEMBRE DE 2007** EL TÉRMINO HÁBIL SEÑALADO POR LA

LEY EXPIRA EL **27 DE FEBRERO DE 2008**

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

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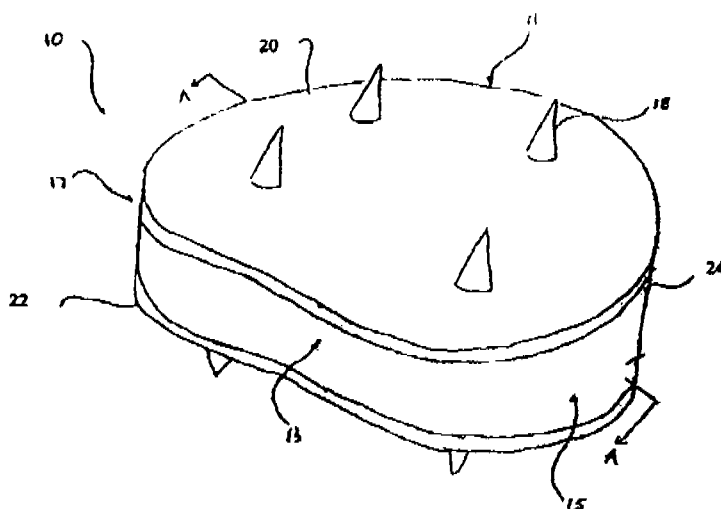
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60/403,402 15 August 2002 (15.08.2002) US
- (71) Applicants and
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- (74) Agents: **POISSANT, Brian, M.** et al.; Pennie & Edmonds LLP, 1155 Avenue of the Americas, New York, NY 10036 (US).
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(54) Title: CONTROLLED ARTIFICIAL INTERVERTEBRAL DISC IMPLANT



(57) Abstract: The invention relates to an artificial intervertebral disc for placement between adjacent vertebrae. The artificial intervertebral disc is preferably designed to restore disc height and natural disc curvature, allow for a natural range of motion, absorb shock and provide resistance to motion and axial compression. Furthermore, the intervertebral disc may be used in the cervical, the thoracic, or the lumbar regions of the spine. The artificial intervertebral disc may include either singularly or in combination: an interior including at least one spring member preferably incorporating an arcuate surface member, a flexible core, the flexible core preferably being a slotted core, a ring spring, a winged leaf spring, or a leaf spring, or. The articulating member preferably being attached to one of the endplate by an intermediate shock absorbing element.

WO 2004/016217 A2

the peripheral spring elements 30. Such an arrangement may result in a disc having a central spring which provides primary shock absorption and resistance during the initial stages of an axial compression evolution, and having peripheral spring elements 30 which provide secondary shock absorption and resistance during the later phases of axial compression. This provides a desirable non-linear response to compressive loads which may closely mimic the response of the patient's natural disc.

[0074] As shown in Figure 2a, each spring element 30 has first and second ends associated with respective upper and lower end plates 20, 22. The first and second ends of each spring may have an associated spherical articulation member 34 configured to mate with a corresponding spherical socket 36 formed on the inner surface of the upper and lower endplates 20, 22 as previously described. The combination of spring and articulation members permits the upper and lower endplates 20, 22 to move with respect to each other. For example, articulation members 34 may articulate within associated sockets 36 so that the upper and lower endplates 20, 22 can articulate with respect to each other without creating resistive torsion in spring elements 30 that would be present if the ends of the springs were rigidly connected to the endplates. Alternatively, each spring element 30 may only be attached to a spherical member 34 on one end, the other end being attached to the upper or lower endplate 20, 22 as previously described.

[0075] Referring to Figure 2b, the disc 10 may include a plurality of spring elements 30 where only one end of the first spring element 30 comprises a spherical articulation member 34, and the opposite end of the first spring element 30 as well as both ends of the second spring elements 30 are disposed within corresponding pockets, or recesses, in the upper and lower endplates 20, 22 (the arrangement and connection of these recesses and the associated spring elements being the same as previously described in relation to the embodiment of Figure 2). As shown in Figure 2b, preferably the first spring element 30 is attached to a hemi-spherical member 34 for mating with a corresponding socket 36 located in the upper or lower endplate 20, 22. The plurality of second spring elements 30 surrounding the first spring element 30 being attached directly to the upper and lower endplates 20, 22 as previously described. In one embodiment, the first spring may be attached to one hemi-spherical member 34, and the plurality of second spring elements 30 may be attached to two hemi-spherical member 34. As with the previous embodiments, the number, stiffness, and arrangement of the springs, as well as the selection and placement of the articulating elements and sockets 36 may be made in any combination appropriate to provide a disc that mimics as closely as possible the properties of the normal intervertebral disc, or that provides the properties appropriate to the particular procedure.

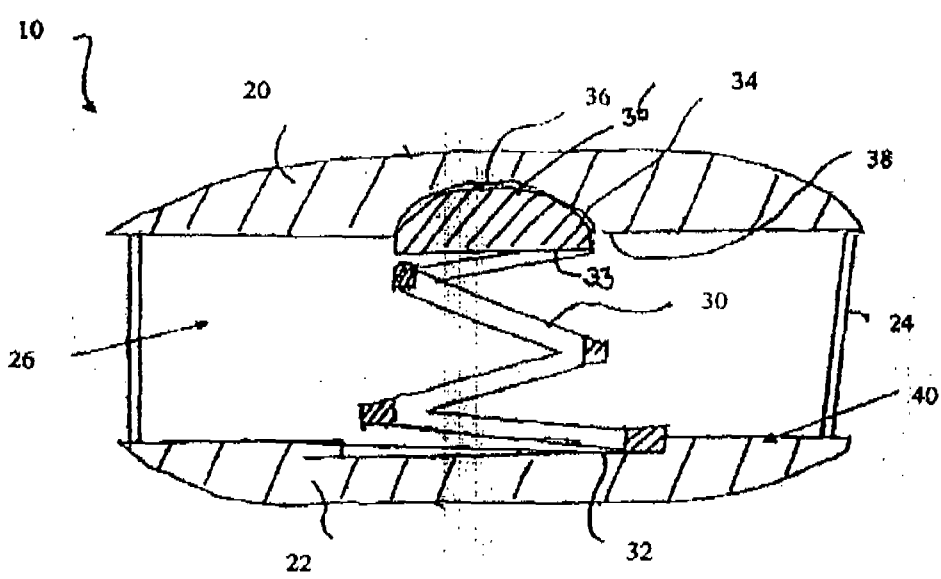
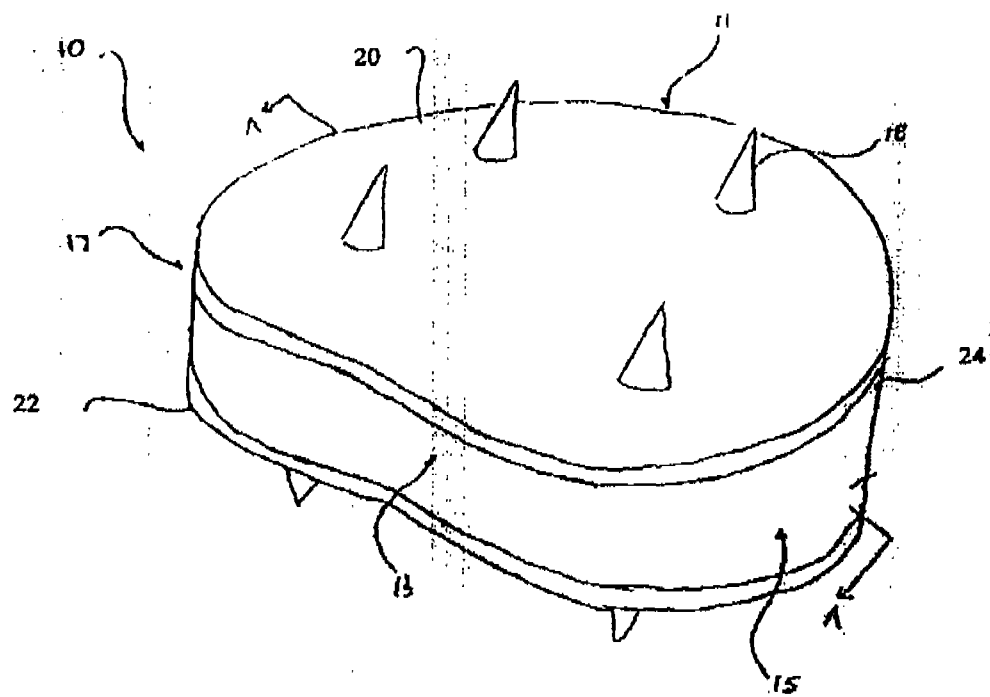
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[0076] Referring to Figure 2c, the disc 10 may include an elastomeric strut 54 located peripherally to a central spring element 30. The strut 54 may have a longitudinal axis and first and second ends, and each end may be associated with an upper or lower endplate 20, 22. The elastomeric strut 54 may be seated in a groove 32 formed in the associated inner surfaces 38, 40 of the upper and lower endplates 20, 22 to resist displacement. The elastomeric strut 54 may serve essentially the same function as peripheral spring elements 30 previously described, i.e. to provide the disc 10 with compression force resistance and shock absorption and to resist motion. The elastomeric strut 54 may be formed from any appropriate material known in the art including, but not limited to, polyurethane or silicone. Any number of individual struts 54 may be provided, and the struts individual struts may assume various shapes in order to provide the appropriate stiffness or resistance support for the end plates. Thus, the struts 54 may be cylindrical, square, rectangular, etc., and they may have any appropriate cross section, such as circular, triangular, elliptical, etc. The struts may also be provided with continuous or non-continuous cross-sections, and they may be made up of different layers of materials, such as having alternating elastomeric and metallic or polymer layers. The struts 54 may also be hollow, or they may be ring-shaped. The ring-shaped struts 54 may be configured to surround at least a portion of the first spring element 30. As with earlier embodiments, the ends of struts 54 may be connected to the end plates using any appropriate method in the art, including press-fit, bonding agents, etc. One or more struts may also be provided to move within their associated groove or grooves. The arrangement, number and configuration of the struts 54 is not critical, but instead may be any combination desired to provide a disc 10 that mimics the properties of the patient's normal intervertebral disc, or that provides the properties appropriate to the particular procedure.

[0077] The inner surfaces 38, 40 of endplates 20, 22 may be porous to allow the elastomeric strut 50 to be integrated into the corresponding surfaces of the upper and lower endplates 20, 22 during manufacture such as by molding the elastomer to the endplate. A membrane and/or barrier may also be included within endplates 20, 22 to limit the depth of impregnation and bony ingrowth respectively.

[0078] The disc 10 of this embodiment also may include a membrane 24 and a valve (not shown), the valve providing access to the interior 26 of disc 10 so that fluid may be injected into, or removed from, the interior 26 of the disc 10. The valve preferably is a one-way valve, as known to those skilled in the art, so that the fluid, once injected, can not escape from the interior 26 of the disc 10. Preferably, the valve is disposed through the elastic membrane 24, alternatively however, the valve may be disposed through the upper

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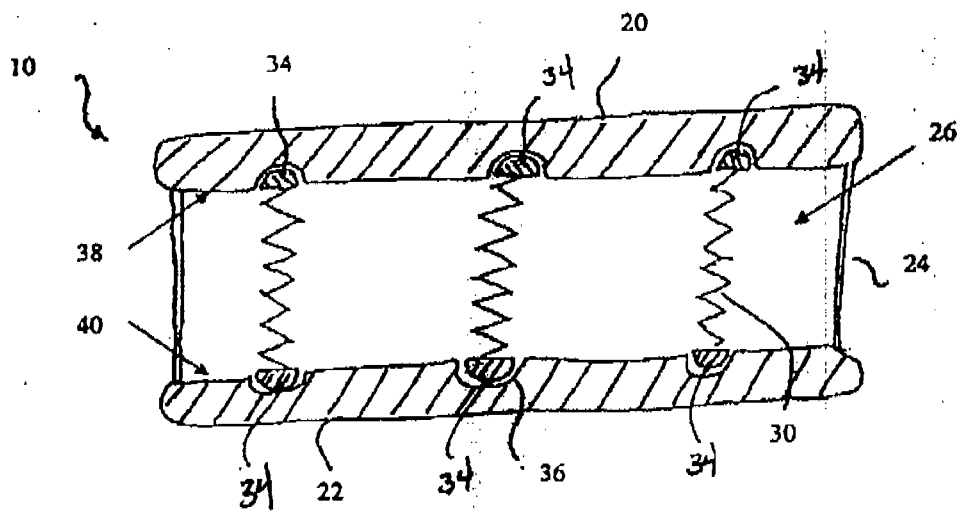


Figure 2a

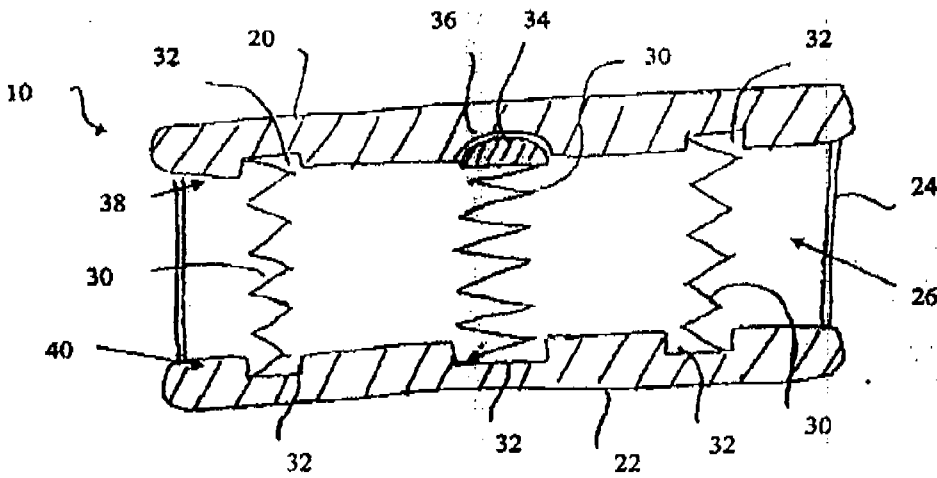


Figure 2b

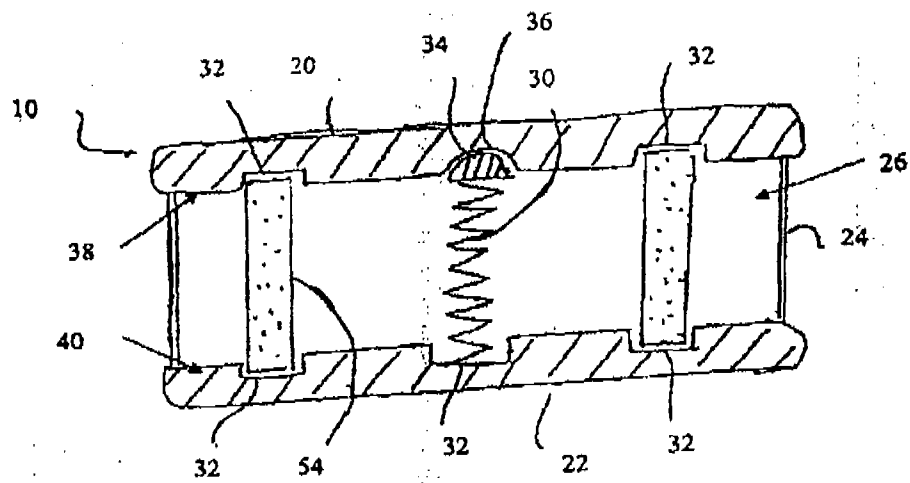


Figure 2c



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Gauchet et al.

(10) **Patent No.:** **US 6,579,320 B1**
(45) **Date of Patent:** **Jun. 17, 2003**

(54) **INTERVERTEBRAL DISC PROSTHESIS
WITH CONTACT BLOCKS**

(75) **Inventors:** **Fabien Gauchet**, Duvy (FR);
Pierre-Henri Saint-Martin, Pessac
(FR); **William Kelly**, Montville, NJ
(US)

(73) **Assignee:** **Stryker Spine (FR)**

(*) **Notice:** Subject to any disclaimer, the term of this
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(52) **U.S. Cl.** **623/17.15**

(58) **Field of Search** 623-17.11, 17.13,
623-17.15, 17.16

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,946,378 A 8.1990 Hirayama et al.
5,370,697 A * 12.1994 Baumgartner 623/17
5,458,642 A * 10.1995 Beer et al. 623/17
5,534,030 A 7.1996 Navarro et al.
5,674,294 A 10.1997 Bainville et al.
5,824,094 A * 10.1998 Serhan et al. 623/17
6,019,793 A * 2.2000 Perren et al. 623/17

FOREIGN PATENT DOCUMENTS

EP 0 356 112 2/1990

* cited by examiner

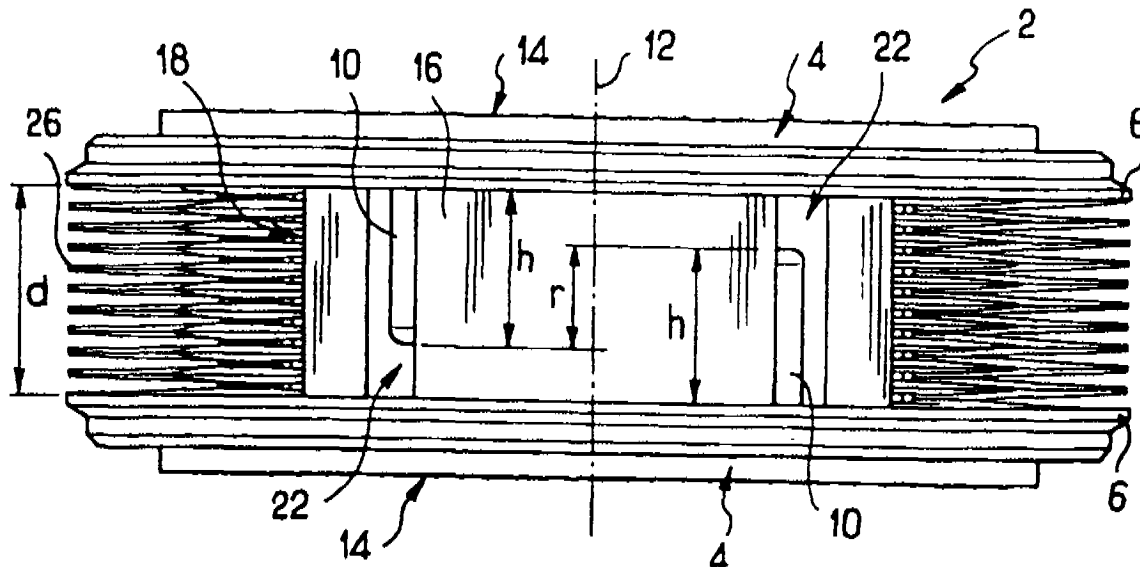
Primary Examiner—Eduardo C. Robert

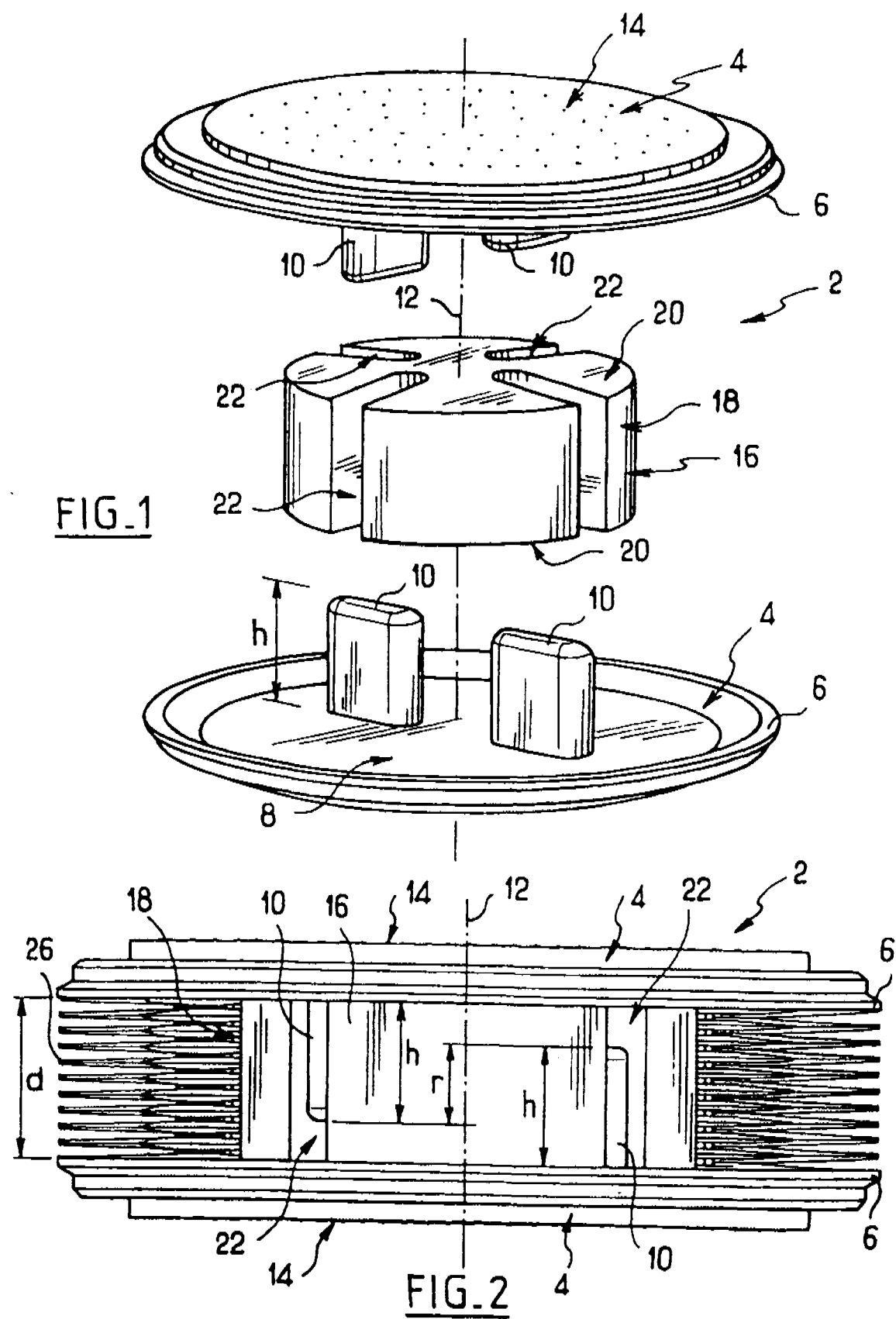
(74) *Attorney, Agent, or Firm*—Lerner, David, Littenberg,
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(57) **ABSTRACT**

An intervertebral disk prosthesis comprising two plates and
a cushion interposed between the plates is contemplated.
The cushion includes a compressible body having two ends
in contact with the plates. At least one of the plates com-
prises at least one stud for stressing the body along a
direction not parallel to a main access of the prosthesis and
mobile relative to the body. Thus the prosthesis imitates and
approximates the mechanical properties of a healthy natural
intervertebral disk.

21 Claims, 4 Drawing Sheets





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Other characteristics and advantages of the invention will also become apparent from the following description of two preferred embodiments given as nonlimiting examples.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded perspective view of a prosthesis according to a first preferred embodiment, without its bellows;

FIG. 2 is a side view of the prosthesis from FIG. 1, partially cut away in the area of the bellows;

FIG. 3 is a perspective view of an alternative to the prosthesis of the first embodiment;

FIGS. 4 and 5 are perspective views of a prosthesis according to a second preferred embodiment, in the assembled state and in an exploded representation, respectively; and

FIGS. 6 and 7 are perspective and plan views, respectively, of the body of the prosthesis in FIG. 4.

DETAILED DESCRIPTION OF THE INVENTION

Referring to FIGS. 1 and 2, an intervertebral disc prosthesis 2 is shown. The intervertebral disc prosthesis 2 is intended for the lumbar region of the spine.

The prosthesis 2 comprises two plates 4 which are identical to each other. Each plate 4 has a generally planar disc shape. In the present embodiment, each plate has a slightly raised peripheral edge 6 projecting from a plane central inner face 8, thus giving it the appearance of a saucer.

Each plate comprises contact studs 10, preferably two identical contact studs. Each contact stud 10 has the general shape of a rectangular pipe with one edge in contact with the plate, and the other edge rounded. The height and width of the contact stud are about equal, but the thickness is substantially smaller. The contact studs 10 project perpendicularly from the inner face 8 and are arranged symmetrically with respect to a main axis 12 of the prosthesis passing through the center of the face 8. The contact studs 10 are substantially perpendicular to the face 8 when not stressed. The thickness of the contact studs 10 extends in a plane radial to the axis 12 so that the two contact studs are substantially in the same radial plane, either side of the axis 12. On a plane outer face 14, the plate has reliefs making it easier to fix the plate 4 to a vertebral plate, for example, by means of a hydroxyapatite covering. The plates can be made of metal or composite material.

The prosthesis comprises a body 16 of general cylindrical shape, having a cylindrical outer face 18 and two opposite plane end faces 20. The body 16 is here made of an elastic material such as an elastomer. The body defines channels or recesses 22, here four in number. The channels are profiled in a direction parallel to the axis 12 of the body 16. The profile is identical to the profile of the contact studs 10 in a plane transverse to the height of the contact studs 10 or the axis 12. Each channel 22 thus has a generally plane shape and extends in a radial plane to the axis 12. Each channel 22 extends at a distance from the axis 12 and opens out on the cylindrical face 18 across its entire height and on each of the two end faces 20. Viewed from the end, the body thus has a cross or cloverleaf shape.

For assembly, the body 16 is arranged between the two plates 4 which have their inner faces 8 and their contact studs 10 facing each other, the two plates being mutually offset by a quarter turn about the axis 12, the four channels 22 being in line with the four contact studs. The two plates

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4 are moved toward each other until their inner faces 8 come into surface contact with the end faces 20 of the body, the four contact studs 10 penetrating the four respective channels 22. The four contact studs thus belong to the two plates alternately about the axis 12. The plates 4 bear on the body 16 without any anchoring other than the contact studs. The body 16 is immobilized by bearing on the inner faces 8 and the contact studs 10, the latter by themselves prohibiting its displacement in translation in a plane perpendicular to the axis 12.

The prosthesis comprises a compressible bellows 26 in the form of a sleeve which has a corrugated profile and is fixed to the edges 6 of the two plates in order to isolate the space to the inside of the bellows, including the body 16, from the outside. In this case, the bellows has ten convolutions, which creates nine crests in addition to the crests fixed to the edges 6. The bellows and the plates can be made of titanium or titanium alloy.

In FIG. 2, the prosthesis is illustrated in the unstressed state. Each contact stud 10 has, on the axis 12, a height h of between about $0.60d$ and about $0.90d$, where d is a distance, taken between the edges 6, separating the two plates when the prosthesis is in the unstressed state. In the present case, h is equal to about $0.75d$.

In one embodiment, the contact studs 10 of one plate partially overlap the contact studs 10 of the other plate as shown in FIG. 2. Thus, any cut through the prosthesis transverse to the axis 12 intercepts two contact studs 10 of the same plate 4 in the vicinity of the end faces 20, and the four contact studs in a median portion of the body. The length of overlap r , measured parallel to the axis 12, can be between about $0.35d$ and about $0.65d$ or between about $0.45h$ and about $0.85h$. Here, r is equal to about $0.66h$ and about $0.5d$.

Once fitted, the prosthesis behaves as follows.

If the prosthesis is subjected to rotation about the axis 12, the contact studs 10 cooperate with the body 16 in order to take up a large part of the generated stresses, which locally are shearing stresses.

If the prosthesis is compressed on its axis 12, the four contact studs 10 each penetrate further into their channel 22, moving in the direction of the opposite plate. The resistance of the prosthesis to shearing perpendicular to the axis 12 or to rotation about this axis is therefore greater.

If the prosthesis is subjected to flexion about an axis perpendicular to the axis 12, the two plates 4 incline relative to each other, which corresponds locally to a compression on certain parts of the body 16 and to a traction on other parts of the body. The resistance to shearing is thus increased in the former and reduced in the latter.

Although the body 16 is deformable, the movement of each contact stud 10 in its channel 22 is on the whole similar to a sliding movement.

Referring to FIG. 3, it is possible for each plate 4 to have two lugs 30 projecting from the outer face 14 of the plate 4 perpendicular to the plane of the plate. Each lug 30 has an orifice 32 passing right through it in the direction of the center of the plate and an identification of spherical shape on a face of the lug directed away from the plate. The orifices 32 can receive a bone screw 34 having a head whose lower face has a male spherical shape interacting with the female indentation of the lug 30 in order to permit free orientation of the screw relative to the associated lug.

For short-term anchoring of the disc prosthesis in the column, the screws 34 can be anchored in the body of the vertebrae adjacent to the disc which is to be replaced.

Each of the plates and also the body are made separately by injection molding.

The prosthesis tolerates prolonged cyclic loading without modification of its shape.

In some known prostheses, the joint between the plates and the body is fragile and risks rupturing. The prosthesis according to the invention eliminates this risk since the plates are designed to be movable by sliding on the body.

The contact studs limit the extension of the body beyond the contour of the plates, particularly during axial compression.

The body can have a spatially variable modulus of elasticity.

The body can be made of a number of materials.

When a homogeneous elastomer is used for the body, or an elastomer having the same modulus of elasticity everywhere, the ratio of the axial compression rigidity to the torsional rigidity is generally too high. To reduce the axial rigidity without reducing the torsional rigidity too much, one of the two following alternatives can be applied. First, the center of the body can be made of an elastomer which is less rigid than that of the periphery of the body. This reduces the compression rigidity without too much affecting the torsional rigidity since the latter is governed mainly by the periphery of the body. Second, a cavity can be formed in the inner surface of the plates in contact with the body, in order to reduce the surface of contact of the plates with the body. This reduces the volume of elastomer which is compressed in the event of axial compression, thereby diminishing the axial rigidity, but once again without too much affecting the torsional rigidity.

Many modifications can of course be made to the invention without departing from the scope thereof.

The contact stud 10, if there is only one per plate, can be at the center of the plate which bears it.

The contact stud or each contact stud 10, 110 can be in contact with the opposite plate 4, 104 when the prosthesis is not stressed or only when the compression of the prosthesis in the area of the contact stud exceeds a certain limit: the contact stud thus forms a stop limiting certain types of movements.

It is conceivable that only one of the plates 4, 104 will have one or more contact studs 10, 110.

The body 16, 116 can be made of a viscoelastic material such as silicone.

The contact studs will be able to have another shape, for example a cylindrical shape with an axis parallel to the axis 12, 112.

The contact stud will be able to extend in the body within a seat which does not open out on a lateral face of the body.

Although the invention herein has been described with reference to particular embodiments, it is to be understood that these embodiments are merely illustrative of the principles and applications of the present invention. It is therefore to be understood that numerous modifications may be made to the illustrative embodiments and that other arrangements may be devised without departing from the spirit and scope of the present invention as defined by the appended claims.

What is claimed is:

1. Intervertebral disc prosthesis having a main axis, comprising:

two plates, wherein at least one of the plates includes at least one contact stud; and

a deformable body interposed between the plates, wherein upon movement of the at least one of the plates having the at least one contact stud, the at least one contact stud stresses the body in a direction not parallel to the main axis of the prosthesis and the at least one contact stud is slidably movable relative to the body.

2. Intervertebral disc prosthesis having a main axis, comprising:

two plates; and

a deformable body interposed between the plates, wherein at least one of the plates comprises at least one contact stud slidably movable in the body.

3. Prosthesis according to claim 1 or 2, wherein the at least one contact stud is located at an off-center position on the at least one plate.

4. Prosthesis according to claim 1 or 2, wherein the at least one contact stud extends from the at least one plate to a distance from the other plate when the prosthesis is not stressed.

5. Prosthesis according to claim 1 or 2, wherein the at least one contact stud has a length of between about 0.60 and about 0.90 of the distance separating the two plates when the prosthesis is not stressed.

6. Prosthesis according to claim 1 or 2, wherein the at least one contact stud immobilizes the body relative to the at least one plate so that no displacement parallel to the at least one plate occurs.

7. Prosthesis according to claim 1 or 2, wherein the at least one contact stud defines a flattened shape in a plane radial to the main axis of the prosthesis.

8. Prosthesis according to claim 1 or 2, wherein the at least one contact stud defines a flattened shape in a plane tangential to a direction circumferential to the main axis of the prosthesis.

9. Prosthesis according to claim 1 or 2, wherein a lateral face of the at least one contact stud extends continuously around an outer lateral face of the body.

10. Prosthesis according to claim 1 or 2, wherein the plate opposite the at least one plate including the at least one contact stud defines a recessed zone opposite the at least one contact stud when the prosthesis is at rest.

11. Intervertebral disc prosthesis having a main axis, comprising:

two plates, wherein at least one of the plates includes at least one contact stud;

a deformable body interposed between the plates, wherein upon movement of the at least one of the plates having the at least one contact stud, the at least one contact stud stresses the body in a direction not parallel to the main axis of the prosthesis and the at least one contact stud is movable relative to the body; and

wherein the body defines a recess opening into a lateral face of the body and the at least one contact stud extends in the recess opening.

12. Intervertebral disc prosthesis having a main axis, comprising:

two plates, wherein at least one of the plates includes at least one contact stud;

a deformable body interposed between the plates, wherein upon movement of the at least one of the plates having the at least one contact stud, the at least one contact stud stresses the body in a direction not parallel to the main axis of the prosthesis and the at least one contact stud is movable relative to the body; and

wherein the at least one contact stud has a cylindrical lateral face, and the body has a cylindrical face bearing on the cylindrical face of the at least one contact stud.

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**SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIRECCION DE NUEVAS CREACIONES**

202086
Bogotá, D.C.,

Abogado
EMILIO FERRERO

ASUNTO	Radicación	06-105186
	Trámite	002
	Evento	001
	Actuación	430
	Oficio	
	Folios	14

Patente de Invención ☒ Patente de Modelo de Utilidad ☐

Vía Nacional ☐

Vía PCT (fase nacional) ☒ Cap. I ☐ Cap. II ☒

No. Sol. Internacional PCT/CH2004/000210
Fecha de Presentación Internal. 02-04-2004

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 le comunica:

1. Documentos estudiados

Descripción:	Folios: 29 a 37
Reivindicaciones:	Folios: 46 a 49
Dibujos:	Folios: 27 a 28
Prioridad:	Folios: 16 a 28 El solicitante no reivindico prioridad

2. Objeto de la invención

- Título de la solicitud: "DISCO INTERVERTEBRAL PROTESICO O VERTEBRA ARTIFICIAL" (folio 29).
- Objeto de la invención: se refiere a una vertebra artificial.

Según el autor los discos conocidos en el arte poseen un elemento de compresión (resorte) con una flexibilidad muy baja especialmente cuando

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dicha compresión es baja y por lo tanto la libertad de movilidad e la columna vertebral se limita. Por lo tanto, el autor propone un vertebra artificial que tenga una zona media elástica (compuesta de varios resortes) ensamblada a los elementos convencionales y que tenga una característica de resorte progresiva.

- El objeto de esta invención se clasifico como A61F2/44; A61F2/00 según la Clasificación Internacional de Patentes (IPC.).

3. De la solicitud de Patente

3.1. Reivindicaciones (artículo 30 D 486)

Después de realizar el estudio completo de la solicitud, se hacen las siguientes observaciones a este capítulo:

- Se sugiere al solicitante definir mejor la expresión: “pueden ejecutar un movimiento trasnacional limitado” (reiv. 13, folio 49). Al mismo tiempo corregir el termino “acial” por axial ya que este error se presenta en algunas de las reivindicaciones.

4. Determinación del Estado de la Técnica

Teniendo en cuenta que la fecha de presentación internacional es 02-04-2004, se encontraron los siguientes documentos relevantes:

N.	Documento	Título	Fecha de pub.
D1	WO2004/016217	CONTROLLED ARTIFICIAL INTERVERTEBRAL DISC IMPLANT	26-02-2004
D2	US6579320	INTERVERTEBRAL DISC PROSTHESIS WITH CONTACT BLOCKS	17-06-2003

5. Análisis de patentabilidad (artículo 14 D486)

5.1 Novedad (artículo 16 D486)

El estudio se realizo comparando elemento por elemento de la invención tal como esta definido en la reivindicación uno (1) con el documento D1, encontrando que el mencionado documento revela todos los elementos y características de dicha reivindicación:

Reivindicación Uno (1, folios 46-47)	D1
1. Un disco intervertebral protésico (1) o un implante intervertebral, que comprende: A) una parte media (2) que tiene un eje longitudinal central (6), un extremo superior (4) y un extremo inferior (5).	Ver: elementos 20, 22, 38, 40 figuras 1-2C.

2. B) una placa de oposición superior (7), que está dispuesta a través del eje longitudinal (6) sobre el extremo superior (4) de la parte media (2) y es adecuado para entrar en contacto con la placa inferior de una vértebra	Ver: elementos 20, 38 figuras 1-2C.
3. C) una placa de oposición inferior (8), que está dispuesta a través del eje longitudinal (6) sobre el extremo inferior (5) de la parte media (2) y es adecuado para entrar en contacto con la placa superior de una vértebra; y por medio de la cual	Ver: elementos 22, 40 figuras 1-2C.
4. D) la parte media (2) comprende medios elásticos (19)	Ver: elementos 26, 30 figuras 1-2C.
5. E) los medios elásticos (19) tienen una característica de resorte progresivo	Ver: elementos 26, 30 figuras 1-2C.
6. F) se suministra un centrado para los medios elásticos (19)	Ver: elementos 26, 30 figuras 1-2C.

De acuerdo con lo anterior, todos los elementos y características que forman parte del "DISCO INTERVERTEBRAL PROTESICO O VERTEBRA ARTIFICIAL" mostrados en la reivindicación independiente uno (1, folios 46-47) ya fueron divulgados en D1, por lo cual se podría considerar que carece de novedad. La invención definida en la reivindicación uno (1) esta presentada de forma muy general y en ella no se aprecia ningún elemento o aporte nuevo al estado de la técnica.

El capítulo reivindicatorio no muestra en forma clara lo nuevo que se pretende aportar a la técnica ni aporta diferencias a lo ya existente. El análisis anterior permitiría afirmar que la presente solicitud no cumpliría con lo estipulado en el artículo 16 de la Decisión 486 de la Comisión de la Comunidad Andina de Naciones.

5.2 Nivel Inventivo (artículo 18 D486)

Continuando con el estudio de patentabilidad, la reivindicación dependiente nueve (9, folio 48) define un implante con un resorte axial que en la posición $x=0$ permite que únicamente el resorte (18) este en contacto con las placas de oposición (7, 8) Esta configuración en un implante para columna fue revelada por D2 que sugiere y demuestra un resorte ubicado en las mismas condiciones (Ver en D2: elementos 6, 10 figura 2, columna 4 fila 19 a 45, columna 7 fila 39 a 45).

Así las cosas, la solicitud se vería afectada por nivel inventivo ya que no sería difícil para un experto en la materia tomar como base la invención propuesta por D1 ubicando algunos de los resortes de forma tal que en posición de deflexión cero tengan contacto con ambas placas de oposición como lo sugiere el documento D2 logrando así mejorar la flexibilidad del implante inclusive para compresiones de valores bajos. Hecho que no constituye un resultado sorprendente e inesperado y que por el contrario se ubica en el desarrollo normal de la tecnología. El análisis anterior permitiría afirmar que la presente solicitud no cumpliría con lo estipulado en el artículo 18 de la Decisión 486 de la Comisión de la Comunidad Andina de Naciones.

6. Conclusión:

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

N°	Documento N°	Reivindicaciones afectadas	Requisito que afecta
D1	WO2004/016217	1-14	NOVEDAD
D1	WO2004/016217	1-14	NIVEL INVENTIVO
D2	US6579320	1-14	NIVEL INVENTIVO

- Se sugiere al solicitante tener en cuenta las observaciones hechas en el numeral tres (3) y realizar el cambio de modalidad de patente de invención a patente de modelo de utilidad, debido a que la presente solicitud no cumpliría con el requisito de nivel inventivo

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 (60) 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 N° 10 de 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
 Directora de Nuevas Creaciones (C)

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

CONCEPTO TÉCNICO No 3839	EXAMINADOR TÉCNICO Código No.202086
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