[Continued on next page]

(54) Title: DEVICES FOR SPACING OF VERTEBRAL MEMBERS OVER MULTIPLE LEVELS

(57) Abstract: The present application is directed to devices to space apart vertebral members (100) over two or more spinal levels. Embodiments of the devices may include a power source (20), supply line (30), and adjustable members (40). The adjustable members may be positioned along two or more spinal levels. The supply line may extend between each of the members and the power source. Activation of the power source may feed power through the supply line and to each of the adjustable members. Members may move from a closed orientation towards an open orientation to space the vertebral members.

Published:
— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
DEVICES FOR SPACING OF VERTEBRAL MEMBERS OVER MULTIPLE LEVELS

Background

The present application is directed to devices and methods for moving vertebral members, and more specifically, to devices and methods for spacing vertebral members over multiple levels.

The spine is divided into regions that include the cervical thoracic, and lumbar regions. The cervical region includes the top seven vertebral members identified as C1-C7. The thoracic region includes the next twelve vertebral members identified as T1-T12. The lumbar region includes five vertebral members L1-L5. The vertebral members are spaced apart forming an intervertebral space between each adjacent vertebral member. Intervertebral discs are located within this space and permit slight flexion, extension, lateral flexion, and rotation.

Various procedures include spacing apart the vertebral members that extend along a section of the spine. These procedures may be required due to damage to one or more of the vertebral members and/or intervertebral discs. The damage may be caused by a specific event such as trauma, a degenerative condition, a tumor, or infection.

Currently, decompression of vertebral members along a spinal section is completed independently at each spinal level. These techniques have the potential for applying too much force at one or more levels that could affect the single or multilevel kinematics of the adjacent spinal levels.

Sumraia

The present application is directed to devices and methods to space apart vertebral members over two or more spinal levels. One embodiment may include a power source, a supply line, and two or more expandable members. Each of the members may be placed at different locations along the spine. The supply line may operatively connect the members with the power supply. Activation of the power supply may cause each of the expandable members to increase in height and space apart the vertebral members within the spinal levels at issue.
Brief Description of the Drawings

Figure 1 is a schematic diagram illustrating a device for spacing vertebral members according to one embodiment.

Figure 2 is a perspective view of an expandable member according to one embodiment.

Figure 3A is a schematic diagram of a member in a first orientation and positioned between vertebral members according to one embodiment.

Figure 3B is a schematic diagram of a member in a second orientation and positioned between vertebral members according to one embodiment.

Figure 4 is a perspective view of a member according to one embodiment.

Figure 5 is a schematic diagram illustrating a device for spacing vertebral members according to one embodiment.

Figure 6 is a flowchart diagram illustrating the steps of using a spacing device according to one embodiment.

Detailed Description

The present application is directed to devices and methods to space apart vertebral members over two or more spinal levels. The devices and methods may include placing expandable members within two or more levels of vertebral members. The expandable members may be connected by a supply line to a power source. Activation of the power source may feed power throughout the supply line and to two or more of the expandable members causing the members to increase in height and apply a common force to the vertebral members.

Figure 1 illustrates one embodiment of a device generally illustrated as element 10 having a power source 20, supply line 30, and adjustable members 40. An adjustable member 40 is positioned between vertebral members 100 over two or more spinal levels. In this embodiment, the supply line 30 extends between each of the members 40 and the power source 20. Activation of the power source 20 may feed power through the supply line 30 and to the adjustable members 40. In one embodiment, members 40 move from a closed orientation towards an open orientation to space apart the vertebral members 100.
In one embodiment, power source 20 provides power to the members 40 to move from the closed orientation towards the open orientation. In one embodiment, the system uses a fluid to adjust the orientation of the members 40. In one specific embodiment, the system uses a hydraulic fluid. In one embodiment, a reservoir 21 may be operatively connected with the power source 20 for holding the fluid when it is not within the supply line 30 and members 40. Reservoir 21 may be an integral with a location located from the power source 20. In one embodiment, power source 20 includes a pump for supplying the fluid through the supply line 30 and into each of the members 40. Power source 20 in one embodiment is adjustable to move fluid into the supply line 30 at various speeds and at various pressures as necessary for the necessary vertebral spacing. In one embodiment, power source 20 may further opiate a reverse direction to pull the fluid from the members 40. The reverse movement of the fluid from the reservoir 40 towards the power source 20 may cause the members 40 to move from the open orientation towards the closed orientation.

Another embodiment includes a power source 20 that moves gas including air. In one embodiment, power source 20 is a compressor that moves the gas into the supply line 30 and members 40. Another embodiment features an electrical power source 20. In one embodiment, expandable members 40 are electrically actuated and movable between the open and closed orientations. Each member 40 may include a torque limiting to control the extent of force applied to the vertebral members 100. In one embodiment, members 40 are movable between open and closed orientations in the embodiment, the members 40 are sized to fit within the intervertebral disc space formed between the vertebral members 100 when in a closed orientation. Figure 2 illustrates one embodiment of a member 40 having a first section 41 and a second section 42. Contact surfaces 49 may be positioned on the outer edges of the sections 41, 42 to contact the vertebral members 100. In one embodiment, first section 41 includes an extension arm 43 that fits within the second section 42 in the closed orientation. In one embodiment, the extension arm 43 extends outward from the second section 42 in the open orientation to space apart the contact surfaces 49.

In one embodiment, contact surfaces 49 may be contoured and/or shaped to correspond to the geometry of the vertebral members 100. Further, contact surfaces 49 in one embodiment may be removable connected to the first and second sections 41, 42.
and are replaceable as necessary to match the geometry of the vertebral members 100. Ylembeis 40 and the contact surfaces 49 may be shaped to simulate loidotic Implants or include implant shaped endplates so the surgeon can template the final implant size in height, width, and depth.

In one embodiment, one or both sections 41, 42 include a connection for attachment of the supply line 30 of fluid, gas, or electricity (henceforth called power) in one embodiment into the member 40 causes the sections to expand thereby increasing the height measured between the contact surfaces 49. In one embodiment, removal of the power from the member 40 causes the sections 41, 42 to move together thus decreasing the height. In one embodiment, member 40 includes a piston that actuates upon receipt of power through the supply line 30.

Figures 3A and 3B illustrate another embodiment of a member 40. In one embodiment, member 40 is of a unitary design having an enclosed interior that is operative) enclosed with the supply line 30. In one embodiment of the closed orientation as illustrated in Figure 3A, member 40 includes a reduced height within the intervertebral space between the vertebral members 100. In one embodiment, member 40 in the closed orientation is sized to contact only one vertebral member 100. In another embodiment, member 40 in the closed orientation may contact two or more vertebral members 100. In one embodiment of a member 40 in the open orientation as illustrated in Figure 3B, member 40 includes a greater size. This increase in size causes the member 40 to contact both vertebral members 100 and applies a spacing force to the vertebral members 100. In one embodiment, member 40 may comprise an expandable or otherwise deformable material that expands when filled with gas or fluid such as water, saline solution, or the like.

Figure 4 illustrates another embodiment of a member 40 having a body 49 and supports 48. In one embodiment, body 34 remains on the exterior of the intervertebral space formed between the vertebral members 100. Supports 48 extend into the intervertebral space and contact the vertebral members 100. In one embodiment as illustrated by the bottom supports 48 of Figure 4, supports 48 include a limited width and are spaced apart forming a working region therebetween to allow for access to the surfaces of the vertebral members 100. The distance between the supports 4S and size of the working region may vary depending upon the context. In one embodiment as
illustrated by the upper support 4S of Figure 4, support 48 covers substantially the entirety of the surface of the vertebral member 500.

In one embodiment, different types of members 40 may be used at different spinal levels to space apart the vertebral members 40. In one embodiment, illustrated in Figure 1, two or more different types of members are positioned within the space between the vertebral members.

In one embodiment, members 40 include a locking mechanism to lock the member 40 at a specific height. Locking members in one embodiment maintain the height even after the power is removed from the member 40. In one method, member 40 is expanded to a height and a locking mechanism is activated to prevent further size changes. After activation, power source 20 can be deactivated without affecting the height of the locked member 40. In one embodiment, the locking mechanism is a valve for maintaining fluid pressure within the member 40. In another embodiment, locking mechanism is a hermetic seal for maintaining gas pressure within the member 40. In another embodiment, locking mechanism is an electronic circuit for maintaining a current or voltage to the member 40.

Supply line 30 may be fluid between the power source 20 and the members 40. The supply line 30 may include the same size between the power source 20 and the members 40, or may include different sizes. In one embodiment, more than one supply line 30 extends between the power source 20 and one or more of the members 40. In one embodiment, as illustrated in Figure 5, supply line 30 includes a main line 31 that extends between the power source 20 and a first connector 35a. A secondary line 32 connects to the downstream side of the first connector 35a and extends to a second connector 35b, and eventually to a third connector 35c. Feed lines 34 extend from each of the connectors 35 to a member 40. In one embodiment, main line 31 may include a larger size than either of secondary 32 and feed lines 34 because it may be required to handle a larger capacity of power than the other two lines.

In one embodiment, connectors, generally referred to as 35, connect together the various lines of the supply line 30. One connector type 35a, 35b, includes a three-way connection having a first and second connections 36, 38 along a first section of the supply line 30, and a third connection 37 that connects with the feed line 34 that leads to and from the member 40. A second connector type 35c includes first and third...
connections 36, 37 as described above. In another embodiment (not illustrated), the farthest secondary line 32 from the power source 20 connects directly with one of the members 40.

In one embodiment, one or more valves 60 may be positioned along the supply line 30 to control the power leading into the members 40. In one embodiment, each of the valves independently control the power introduced into each one or more members 10. In one embodiment, valves 60 may be selectively positionable between open and closed orientations. In one embodiment of the open orientation, the amount of power fed out of the valve 60 is the same that is fed further downstream along the supply line without any affect. In one embodiment of the closed orientation, the amount of power fed from the valve 60 is less than the power fed into the valve 60. In one embodiment, valve 60 can control the amount of power fed from about 100% (i.e., in an open orientation) to about 0% (in a closed orientation).

Valves 60 may be positioned at a variety of locations along the supply line 30. In one embodiment as illustrated in Figure 5, a valve 60 is positioned along the feed line 34 extending between connector 35a and member 40. In one embodiment, more than one valve 60 may be placed along a section of the supply line 30. In one embodiment, multiple valves 60 create safety measures in the event of failure of the power source 20 or other valve 60 along the same supply line 30. In one embodiment as illustrated in Figure 5, a valve 60 is mounted within the connector 35b.

In one embodiment, an indicator 50 may be operatively connected to the supply line 30 to detect the amount of power within the supply line 30. In one embodiment, indicator 50 includes a gauge 51 for visual observation of the power. In one embodiment as illustrated in Figure 5, indicator 50 is connected with the supply line 30 through a line 52. Indicator 50 may be positioned at a variety of locations along the supply line 30. In one embodiment as illustrated in Figure 5, indicator 50 is positioned between the power source 20 and end of the supply line 30. In another embodiment, indicator 50 is positioned at the furthest point from the power source 20. In one embodiment, indicator 50 may be directly connected with the power source 20. In one embodiment, more than one indicator 50 may be connected along the supply line 30.

In one embodiment, a feedback system 70 may be operatively connected with the device 10 to provide immediate, real-time, and/or requested information to the surgeon.
regarding one or more of the device characteristics Feedback system 70 may be
independent or associated with the indicator 50. In one embodiment, feedback system 70
provides an indication when a desired or predetermined separation characteristic of the
members 40 is obtained, and/or when certain threshold separation characteristics are
obtained and/or approached. By way of example, system 70 can provide the force being
exerted by each of the members 40 to the vertebral members 100, and the corresponding
spacing of the vertebral members 100.

Figure 6 illustrates the steps of one method of spacing vertebral members. In one
embodiment, the desired vertebral spacing is determined prior to insertion of the
members 40. In one embodiment, the spacing is determined through preoperative
planning or anatomical studies. In one embodiment, the spacing may correspond to a
maximum pressure or tension that is to be applied to the vertebral members 100. Once
the spacing is determined, an incision is made to access a surgical site on or near the
spinal column. The members 40 are inserted in the incision and placed relative to the
vertebral members 100 (step 400). In one embodiment, members 40 are placed within
the patient in intervertebral spaces between the adjacent vertebral members 100, with the
power source 20 being positioned exterior to the patient.

Once each member 40 is inserted, in one embodiment the power source 20 is
activated to supply power into the supply line 30 (step 402). The fluid moves through
the supply line and into each member 40 thereby causing the member height to increase.
In one embodiment a substantially equal amount of power is introduced into each
member 40 thus causing each member to apply the same force to the vertebral members
100. In one embodiment, the applied force is substantially the same, regardless of the
starring size of the intervertebral disc space or final distraction magnitude. By way of
example using Figure 1, a force applied through a fast member (i.e., the top-most
member as indicated in Figure 1) causes the vertebral members to distract a first amount.
The same force applied through a second member causes the vertebral members to
distract a different amount.

In one embodiment, at some point in the process, the spacing between the
vertebral members 100 is measured (step 404). In one embodiment, physical
measurements of the vertebral rocmbei spacing are taken periodically during the process.
S

If additional spacing is required, the power source 20 is adjusted accordingly (step 408). If the spacing is adequate, the expansion process is complete (step 406).

In one embodiment, once spacing is adequate, replacement spacers are inserted and take the place of the members 40. In one embodiment, the members 100 include operating the power source 20 in a second direction and drawing power from each member 40 causing the height to decrease to an amount that the members can be removed. In one embodiment, the heights of each of the members 40 decreases at the same amount as power is equally drawn from each member 40. In one embodiment, each member 40 is independent! moved towards the closed orientation.

In one embodiment, valves 60 act as the locking mechanisms to control the size of the members 40. Turning the valve 60 from an open to a closed position while in the open orientation prevents a reduction in the member size.

One embodiment includes accessing the spine from an anterior approach to the vertebral spine. Other applications contemplate other approaches, including posterior, posterolateral, antero-lateral and lateral approaches to the spine, and accessing other regions of the spine, including the cervical, thoracic, lumbar and/or sacral portions of the spine.

The embodiments described above feature the members 40 positioned within the intervertebral space formed between adjacent vertebral members. The members 40 may also be used for spacing other sections of the spine, including pedicles, lamina, and processes.

In one embodiment, a single member 40 is positioned between the vertebral members 100. In one embodiment, multiple members 40 are positioned between the same vertebral members 100 to work in combination to achieve the proper spacing.

In one embodiment, the device is modular in the sense that additional members 40 may be added and deleted from the supply line 30. By way of example, the device illustrated in Figure 5 may be increased to add another member 40. This may be accomplished by replacing connector 35c with a three-way connector, such as 35a, and adding additional length to the supply line that extends to another member 40. Likewise, the device 10 may be decreased in size. The example of Figure 5, connector 35b can be replaced with a two-way connector such as 35c to form a device having two members 40.
Spatially relative terms such as "under", "below", "conver\over", "upper", and the like, are used for ease of description to explain the positioning of one element relative to a second element. These terms are intended to encompass different orientations of the device in addition to different orientations than those depicted in the figures. Further, terms such as "first", "second", and the like, are also used to describe various elements, regions, sections, etc and are also not intended to be limiting.

The present invention may be carried out in other specific ways than those herein set forth without departing from the scope and essential characteristics of the invention. More than one power source 20 may be attached to the supply Sine 30. In one embodiment, members 40 remain within the patient in an open orientation during additional surgical procedures. In one embodiment, drawing the power from the member 40 comprises deactivating the power source 20. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.
Claims
What h claimed is:

1. A device to space vertebra! members comprising:
   first and second expandable members;
   a power source; and
   a supply line uperatively connecting the power source with each of the first and second members;
   wherein the power supply is adapted to teed power through the supply line and to each of the first and second expandable members causing the members to increase in size and apply a force to the vertebral members, the force applied by the first and second expandable members being substantially equal.

2. The device of claim 1, wherein the power source is adapted to supply a pressurized material through the supply line to each of the first and second members.

3. The device of claim 2, wherein the pressurised material comprises hydraulic fluid that is moved by the power source through the supply line and into each of the first and second members.

4. The device of claim 2, wherein the pressurized material comprises a gas that is moved by the power source through the supply line and into each of the first and second members.

5. The device of claim 1, wherein the power source is adapted to supply electricity through the supply line to the first and second members.

6. The device of claim 1, further comprising a connector positioned along the supply line, the connector including a first connection with the supply line and a second connection with a feed line that leads to one of the members.

7. The device of claim 6, wherein the connector further comprises a stop at a remote point along the supply line away from the power source.
8. The device of claim 1 therein the first and second members each include a different construction.

9. A device to space vertebral members along the spine, the device comprising:
   a first member positioned within a first space along the spine,
   a second member positioned within a second space along the spine;
   a power source, and
   a supply line operatively connecting the power source with each of the first and second members;
   wherein the power source is adapted to supply power through the supply line to each of the first and second members, the power causing the first and second members to exert a force to the vertebral members adjacent to the first and second spaces, the force applied by each of the first and second members being substantially equal.

10. The device of claim 9, wherein the supply line and power source are adapted to remove the power from the first and second members to decrease the force applied to the vertebral members.

11. The device of claim 9, wherein the supply line comprises a main line feeding outward from the power source and a feed line that extends between the main line and the first member.

12. The device of claim 11, further comprising a connector at the intersection of the main line and the feed line, the connector having a first connection to connect with the main line and a second connection to connect with the feed line.

13. The device of claim 11, wherein the connector further comprises a third connection to connect to a secondary line that leads to the second member.

14. The device of claim 9, further comprising an indicator placed along the supply line to determine a pressure of the material within the supply line.
15. A device to space vertebral members along the spine, the device comprising:

first and second members petitioned within spaces along the spine, the members being positionable between a first orientation having a first size and a second orientation having a second greater size;

a power source to move the first and second members between the first and second orientations; and

a supply grid operatively connecting the power source with the first and second members;

the first and second members moveable between the first and second orientations dependent upon power supplied from the power source, the supply grid causing the power to be substantially equal within the first and second members while moving between the first and second orientations and causing the first and second members to each exert a force to the vertebral members that is substantially equal

16. The device of claim 15, wherein the power source is adapted to move a hydraulic fluid through the supply grid and the first and second members.

17. The device of claim 16, further comprising a reservoir for holding the hydraulic fluid that is outside of the supply grid and the first and second members.

18. The device of claim 15, wherein the power source is adapted to move a gas through the supply grid and the first and second members.

19. The device of claim 15, wherein the first and second members are electrically powered and the power source is adapted to supply electricity through the supply grid to each of the first and second members.

20. A method of spacing vertebral members comprising the steps of

inserting a first member within a first intervertebral space;

inserting a second member within a second intervertebral space;
supplying power to each of the first and second members and causing the
members to expand in size; and
expanding the first and second intervertebral spaces by applying a first force
through the first member to the first intervertebral space that is substantially equal to a
second force that is applied through the second member to the second intervertebral
space, and
maintaining the first and second forces substantially equal during the expanding
of the first and second intervertebral spaces.

21. The method of claim 20, wherein the step of supplying the power comprises using a
common power source and supplying the power to each of the first and second members.

22. The method of claim 20, further comprising expanding the first and second members
to different sizes while maintaining the first and second forces substantially equal.

23. The method of claim 20, wherein the step of supplying the power to each of the first
and second members and causing the members to expand comprises supplying equal
amounts of fluid to each of the first and second members.

24. A method of spacing vertebral members comprising the steps of
inserting a first member at a first spinal level;
inserting a second member at a second spinal level;
activating a power supply and feeding power through a grid to the first and
second members;
causing the first and second members to expand in size from a first size towards a
second size; and
maintaining an equal distraction force while the first and second members expand
from the first size towards the second size.

25. The method of claim 24, further comprising expanding the members to different
sizes and maintaining the distraction force to be substantially equal over the first and
second spinal levels.
INSERT MEMBERS BETWEEN VERTEBRAL MEMBERS

ACTIVATE POWER SOURCE

IS VERTEBRAL SPACING ADEQUATE

ADJUST POWER SOURCE LEVEL

MAINTAIN POWER SOURCE AT PRESENT LEVEL

FIG. 6
A. CLASSIFICATION OF SUBJECT MATTER

INV. A61F2/44

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)

A61F A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
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<th>Relevant to claim No</th>
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<tr>
<td>X</td>
<td>US 2002/183778 A1 (REILEY MARK A [US] ET AL) 5 December 2002 (2002-12-05) paragraphs [0038], [0090], [0091]; figures 1,2</td>
<td>1-4,6, 9-18</td>
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<td>X</td>
<td>US 6 375 682 B1 (FLEISCHMANN LEWIS W [US] ET AL) 23 April 2002 (2002-04-23) column 2, lines 38-48; figures 1b, 1c, 2b, 2c, 2d, 3 column 5, lines 59-64 column 6, lines 20-35 column 8, lines 5-13</td>
<td>1-4,9</td>
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</table>

X Further documents are listed in the continuation of Box C

X See patent family annex

* Special categories of cited documents

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'X' 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

'A' document member of the same patent family

Date of the actual completion of the international search 27 April 2007

Date of mailing of the international search report 08/05/2007

Name and mailing address of the ISA

European Patent Office, P B 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel (+31-70) 340-0240, Tx 31 651 epo nl, Fax (+31-70) 340-3016

Authorized officer Strazdauskas, Gedas

Form PCT/ISA/21O (second sheet) (April 2005)
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**International Search Report**

**Box II** Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. **J(J** Claims Nos.: 20-25 because they relate to subject matter not required to be searched by this Authority, namely.
   - Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
   - Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

2. **X** Claims Nos.: 5, 7, 8, 19 because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically.
   - see FURTHER INFORMATION sheet PCT/ISA/210

3. **☐** Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box III** Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows.

1. **☐** As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. **☐** As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. **☐** As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos .

4. **☐** No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos

**Remark on Protest**

- **☐** The additional search fees were accompanied by the applicant’s protest.
- **☐** No protest accompanied the payment of additional search fees.
Continuation of Box II.1

Claims Nos.: 20-25

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

Continuation of Box II.2

Claims Nos.: 5, 7, 8, 19

Claims 5 and 19

The expression "the power source is adapted to supply electricity" used in claim 5 is vague and unclear due to the vast possibilities the term "electricity" encompasses and leaves thereby the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT.

Claims 5 and 19 are not supported by the description as required by Article 6 PCT, as their scope is broader than justified by the description and drawings. The reasons therefor are the following:

the skilled person for the sake of achieving the equal force applied by the first and second expandable members can apply many different constructions of those expandable members, which should be electrically operated because of the electrical nature of the power source. Also the power source can be connected to said electrically operated expandable members in several different ways. However none of these particularities were sufficiently discussed in the description.

Claim 7

The feature of claim 7, that "the connector further comprises a stop", is not referred to in the description. Claim 7 is therefore not supported by the description as required by Article 6 PCT.

Claim 8

The term "a different construction" used in claim 8 is vague and unclear and leaves the reader in doubt as to the meaning of the technical features to which it refers, thereby rendering the definition of the subject-matter of said claim unclear, Article 6 PCT. Moreover, the different construction such as a different diameter of a piston of a hydraulic expandable member as depicted in fig. 5 of the current application would cause the force applied by said elements to be
different. Thus the subject-matter of claim 8 contradicts the subject-matter of claim 1.

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.
<table>
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