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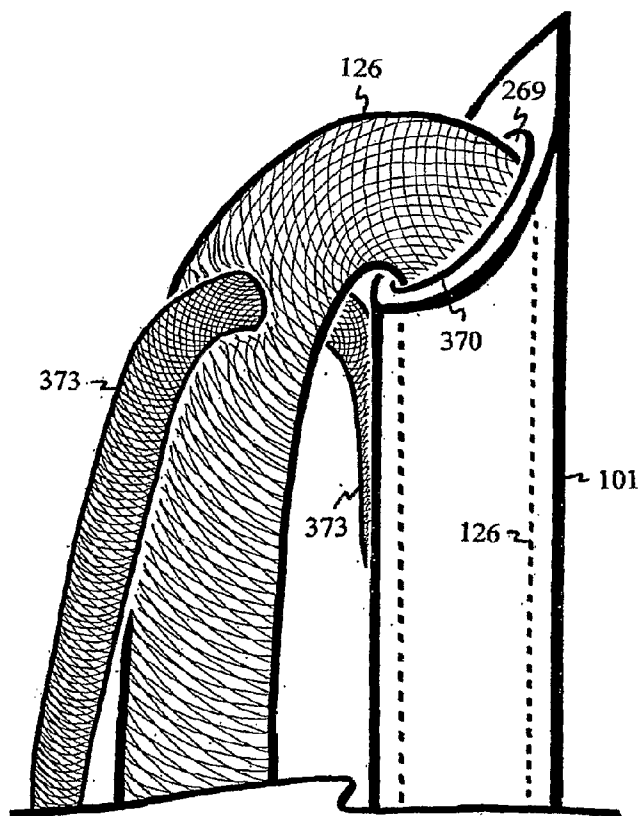
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[Continued on next page]

(54) Title: U-SHAPED DISC-SHUNT AND DELIVERY DEVICE



(57) Abstract: The intervertebral disc contains no blood vessels. Nutrients and waste are diffused mainly through adjacent vertebral bodies. As we age, calcified layers form between the disc and vertebral bodies, blocking diffusion. The disc begins to starve and flatten. The weight shifts abnormally from disc to the facet joints causing strain and back pain. Under anaerobic conditions, lactic acid is produced causing acidic irritation and unspecific pain. A U-shaped disc shunt (126) is delivered into and sealed within the degenerated disc simply by needle puncturing and withdrawal, to draw nutrients from bodily circulation into the avascular disc. A continual supply of nutrients increases biosynthesis of the water-retaining sulfated glycosaminoglycans, hence swelling pressure within the disc. The weight is re-shifted from the facet joints to the regenerated disc, alleviating back pain. With oxygen transported through the shunt, anaerobic production of lactic acid is minimized. In addition, the residual lactic acid is expelled through the U-shaped shunt during disc compression into bodily circulation to alleviate unspecific pain.

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61B17/06 A61F2/44 A61L27/28

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)
A61B A61F A61L

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

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

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/002417 A (YEUNG JEFFREY E [US]) 5 January 2006 (2006-01-05) cited in the application pages 17-19; figures 3,4,6,17,22,23,29,36,38,40,54 -----	1,3-11, 15,16, 20-35
X	US 2004/210209 A1 (YEUNG JEFFREY E [US] ET AL) 21 October 2004 (2004-10-21) cited in the application figures 25,30,31,38-41,65-67,71-74,81,96 -----	1,3-11, 15,16, 20-35
A	WO 00/40159 A (YEUNG TERESA T [US]; YEUNG JEFFREY E [US]) 13 July 2000 (2000-07-13) figures 4,45,62,70 -----	1
A	US 5 370 661 A (BRANCH THOMAS P [US]) 6 December 1994 (1994-12-06) figures 17,22 -----	1
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☒ Further documents are listed in the continuation of Box C.

☒ 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
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- *P* document published prior to the international filing date but later than the priority date claimed

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- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

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INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>WO 98/43544 A (ETHICON INC [US]) 8 October 1998 (1998-10-08) figure 5</p> <p>-----</p>	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/003194

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. ☒ Claims Nos.: 36-38
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. ☐ Claims Nos.:
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:
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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2007/003194

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