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(54) Title: POLYMERIC MATERIALS

(57) Abstract: Topographical features, such as projections or recesses, having a maximum dimension which is less than 3µm, with the features being separated by a distance which is less than 10µm are transferred to polyetheretherketone, on an industrial scale, by injection moulding relatively low viscosity PEEK, using a mould in which is arranged a master structure which carries the desired topography. The topographical features increase the water contact angle of a surface which includes them and such a modified surface has been shown to influence cell attachment and differentiation. Parts which incorporate the topographical features may be used in medical devices such as implantable medical devices for cardiology or for neuromodulation.



# INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2012/051434

## A. CLASSIFICATION OF SUBJECT MATTER

INV. C08L71/00 C08L81/06 A61L27/00  
ADD.

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)

C08G C08L 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 practicable, search terms used)

EPO-Internal, WPI Data, CHEM ABS Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                        | Relevant to claim No.        |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| X         | <p>DATABASE CAPLUS [Online]<br/>CHEMICAL ABSTRACTS SERVICE, COLUMBUS,<br/>OHIO, US;<br/>2003,<br/>FUJI PHOTO FILM CO.: "Manufacture of<br/>pattern transfer sheets by lotus effect<br/>and micropattern formation therewith.",<br/>XP002693415,<br/>Database accession no. 2003:520329<br/>abstract</p> <p style="text-align: center;">-----<br/>-/--</p> | <p>1-10,13,<br/>14,16-18</p> |

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

☒ See patent family annex.

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

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"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

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| X         | BREMUS-KOEBBERLING ET AL: "Laser structuring and modification of surfaces for chemical and medical micro components.",<br>PROCEEDINGS OF THE SPIE -FOURTH INTERNATIONAL SYMPOSIUM ON LASER PRECISION MICROFABRICATION,<br>vol. 5063, 2003, pages 217-222,<br>XP002693416,<br>figure 6,; table 1<br>page 218                                         | 1-6,<br>10-13,<br>15-17,20 |
| A         | -----<br>OLES M ET AL: "LEARNING FROM NATURE - POLYMER SURFACES WITH A NANO STRUCTURE THAT UTILISE THE LOTUS-EFFECT AND CLEAN THEMSELVES",<br>ANNUAL INTERNATIONAL IEEE-EMBS SPECIAL TOPIC CONFERENCE ONMICROTECHNOLOGIES IN MEDICINE AND BIOLOGY. PROCEEDINGS, XX, XX,<br>12 October 2000 (2000-10-12), pages<br>331-333, XP001156599,<br>figure 2 | 1-20                       |
| A         | -----<br>WO 2008/004827 A1 (POSTECH ACAD IND FOUND [KR]; HWANG WOON-BONG [KR]; LEE KUN-HONG [KR];) 10 January 2008 (2008-01-10)<br>claim 1; figures 1,4                                                                                                                                                                                             | 1-20                       |
| A         | -----<br>US 2009/246473 A1 (LEE JIN-KYU [KR] ET AL) 1 October 2009 (2009-10-01)<br>claims 1,3; figure 1                                                                                                                                                                                                                                             | 1-20                       |
| A         | -----<br>WO 2010/043900 A1 (JARMAN-SMITH MARCUS [GB]; HOLDEN ANDREW [GB]; ELLERAY ANDREW [GB]; INV) 22 April 2010 (2010-04-22)<br>claims 1,25                                                                                                                                                                                                       | 1-20                       |
| A         | -----<br>GB 2 458 218 A (INVIBIO LTD [GB]) 16 September 2009 (2009-09-16)<br>claim 1; figure 1<br>-----                                                                                                                                                                                                                                             | 1-20                       |

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

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| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s) | Publication<br>date |
|-------------------------------------------|----|---------------------|----------------------------|---------------------|
| WO 2008004827                             | A1 | 10-01-2008          | KR 20080004409 A           | 09-01-2008          |
|                                           |    |                     | US 2009317590 A1           | 24-12-2009          |
|                                           |    |                     | WO 2008004827 A1           | 10-01-2008          |
| -----                                     |    |                     |                            |                     |
| US 2009246473                             | A1 | 01-10-2009          | CN 101544770 A             | 30-09-2009          |
|                                           |    |                     | DE 102008057346 A1         | 01-10-2009          |
|                                           |    |                     | JP 2009234249 A            | 15-10-2009          |
|                                           |    |                     | KR 20090102922 A           | 01-10-2009          |
|                                           |    |                     | US 2009246473 A1           | 01-10-2009          |
|                                           |    |                     | US 2011097534 A1           | 28-04-2011          |
| -----                                     |    |                     |                            |                     |
| WO 2010043900                             | A1 | 22-04-2010          | CA 2739979 A1              | 22-04-2010          |
|                                           |    |                     | CN 102203175 A             | 28-09-2011          |
|                                           |    |                     | EP 2340277 A1              | 06-07-2011          |
|                                           |    |                     | JP 2012505947 A            | 08-03-2012          |
|                                           |    |                     | KR 20110081853 A           | 14-07-2011          |
|                                           |    |                     | US 2011230590 A1           | 22-09-2011          |
|                                           |    |                     | WO 2010043900 A1           | 22-04-2010          |
| -----                                     |    |                     |                            |                     |
| GB 2458218                                | A  | 16-09-2009          | GB 2458218 A               | 16-09-2009          |
|                                           |    |                     | WO 2009112865 A1           | 17-09-2009          |
| -----                                     |    |                     |                            |                     |