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(81) Designated States (unless otherwise indicated, for every kind of national protection available):

AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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(54) Title: REMOTELY CONTROLLED DRUG DELIVERY SYSTEMS

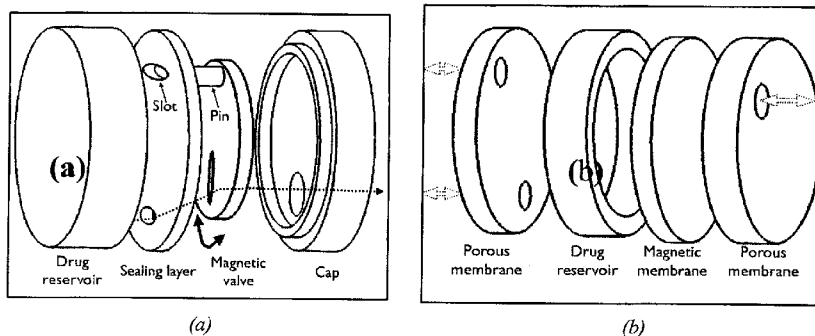


Fig. 1: Conceptual design of the proposed drug delivery devices: (a) drug diffusion through a magnetically-controlled rotating valve; (b) drug delivery using a magnetic membrane pump. Two holes on the porous membrane are shown to represent pores.

(57) Abstract: Drug delivery devices responsive to at least one external stimulus are described, along with methods for their preparation and use. The devices can be configured to respond to the stimulus, providing "on demand" release of one or more deliverables such as pharmaceutical drugs.

**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/IB2011/002535

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC: **A61M 31/00** (2006.01) , **A61K 9/00** (2006.01) , **A61M 37/00** (2006.01) , **A61N 2/10** (2006.01) ,  
**B81B 5/00** (2006.01) , **G02C 7/04** (2006.01)  
 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)  
 IPC (2006.01) : A61M 31/00, A61K 9/00 , A61M 37/00, A61N 2/10, B81B 5/00 , G02C 7/04

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

Electronic database(s) consulted during the international search (name of database(s) and, where practicable, search terms used)  
 EPODOC; TotalPatent; CPD  
 implant, reservoir, membrane, polymer, electromagnetic, active, pore+, porous, displace+, align, nano

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US2002099359A1 (SANTINI Jr, J et al.) 25 July 2002 (25-07-2002) *the whole document*	1-3, 9-13, 19, 21-26, 31-33
X	US2004267234A1 (HEART, G, et al.) 30 December 2004 (30-12-2004) *figure 6, pages 5-7*	1, 2, 21-23, 24, and 26
X	US2003036746A1 (PENNER, A) 20 February 2003 (20-02-2003) *abstract, pages 1, 4*	1-3, 10, 11, 21, and 22,
X	US2008208335A1 (BLUM, R et al.) 28 August 2008 (28-08-2008) *the whole document*	27
A	US2009162250A1(HOOD, L et al.) 25 June 2009 (25-06-2009) *the whole document*	1
A	US2007276337A1(TRIEU, H) 29 November 2007 (29-11-2007) *the whole document*	1

Further documents are listed in the continuation of Box C.                       See patent family annex.

* Special categories of cited documents :	"T" 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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
"E" earlier application or patent but published on or after the international filing date	"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
"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)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 29 February 2012 (29-02-2012)	Date of mailing of the international search report 5 March 2012 (05-03-2012)
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Name and mailing address of the ISA/CA Canadian Intellectual Property Office Place du Portage I, C114 - 1st Floor, Box PCT 50 Victoria Street Gatineau, Quebec K1A 0C9 Facsimile No.: 001-819-953-2476	Authorized officer  <b>Darren Hubley (819) 994-7655</b>
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**INTERNATIONAL SEARCH REPORT**International application No.  
PCT/IB2011/002535

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US6689380B1(MARCHITTO, K et al.) 10 February 2004 (10-02-2004)	1
A	US20020143284A1 (TU, H et al.) 3 October 2002 (3-10-2002)	1
A	US3527220A (SUMMERS, G, et al.) 8 September 1970 (8-09-1970)	1

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

International application No.  
**PCT/IB2011/002535**

Patent document Cited in Search report	Publication Date	Patent Family Member(s)	Publication Date	
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**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of the 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.  Claim Nos. : 28-30  
because they relate to subject matter not required to be searched by this Authority, namely :  
  
Claims 28-30 are directed to a method for treatment of the human or animal body by surgery or therapy which the International Search Authority is not required to search.
2.  Claim 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.  Claim Nos. :  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box No. 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 :

The claims are directed to a plurality of inventive concepts as follows:

Group A - Claims 1-26 and 31-33 are directed to a delivery device comprising a reservoir and a release mechanism, the mechanism adapted to selectively release the deliverable upon application of an external stimulus..

Group B - Claim 27 is directed to a device comprising a shape changing polymeric membrane associated with a contact lens, whereby application of an external stimuli causes a change in the focal length of the contact lens.

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 additional fees, this Authority did not invite payment of additional fees.
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 claim 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 claim Nos. :

- Remark on Protest**  The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.