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(54) Title: POLYSACCHARIDE BIOMATERIALS AND METHODS OF USE THEREOF

(57) Abstract: The invention includes a medical hydrogel made from polymerized polysaccharide macromers. The macromers are preferably polysaccharides decorated with polymerizable groups, for example, methacrylates. The macromers may also be made into polymers of at least two macromers polymerized together. These polymers are preferably multi-armed or high-molecular weight and used for medical uses, for example, making coatings on medical devices. Macromers of N-vinylpyrrolidone are also disclosed herein.



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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 A61L27/20 A61L27/34 A61L27/52 A61L33/08 A61L33/10

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 7 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE WPI Section Ch, Week 199842 Derwent Publications Ltd., London, GB; Class A14, AN 1998-493796 XP002217699 & SU 1 078 894 A (UNIV MOSC LOMONOSOV), 10 January 1998 (1998-01-10) abstract	1-12, 17-23, 40-49, 54-60
Y		13-16, 50-53, 79-82
X	US 5 846 530 A (HEINTZ ROSWITHA A ET AL) 8 December 1998 (1998-12-08) column 2, line 65 -column 4, line 33 --- -/--	1-23, 40-60



Further documents are listed in the continuation of box C.



Patent family members are listed in 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
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- *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
- *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
- *Z* document member of the same patent family

Date of the actual completion of the international search

22 October 2002

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05.03.03

Name and mailing address of the ISA

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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.
X	US 6 007 833 A (CHUDZIK STEPHEN J ET AL) 28 December 1999 (1999-12-28) column 5, line 9 - line 15 column 5, line 47 - line 60 column 10, line 16 - line 40; claims 1-4,12,13; examples 7,18,19	1-12, 17-23, 40-49, 54-60
Y		13-16, 50-53, 79-82
X	WO 00 12146 A (HUBBELL JEFFREY A ;EIDGENOESSISCH TECH HOCHSCHULE (CH)) 9 March 2000 (2000-03-09) page 5, line 28 -page 7, line 30 page 11, line 26 -page 12, line 5; claims 1-5,10,15,17	13-16, 50-53
X	US 5 851 229 A (DEPREKER JENNIFER ET AL) 22 December 1998 (1998-12-22) column 3, line 1 -column 5, line 24; claims 1-3,12-14,19	1-23, 40-60
X	US 5 410 016 A (HUBBELL JEFFREY A ET AL) 25 April 1995 (1995-04-25)	1-12, 40-49, 54-60
Y	the whole document	79-82
X	US 6 027 741 A (CIALDI GLORIA ET AL) 22 February 2000 (2000-02-22) column 3, line 67 -column 4, line 33 column 14, line 53 - line 60	1-12, 40-49
Y	example 16	79-82

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Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.:
because they relate to subject matter not required to be searched by this Authority, namely:

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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

1-23, 40-60, 79-82

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-23, 40-60, 79-82

A medical apparatus comprising a hydrogel made of polysaccharides in the form of a hollow cylinder, a coating comprising the hydrogel, methods for their preparation and also an artificial blood vessel made of the hydrogel.

2. Claims: 24-29, 61-63

material made of polyvinylpyrrolidone macromers, used for medical devices, coatings of medical devices and the method for coating

3. Claims: 30-39, 64-78

preparation of a modified polysaccharide comprising at least two polysaccharide macromers that is soluble and has a multi-armed structure, method of making the preparation and method of making a coating on a medical device

INTERNATIONAL SEARCH REPORT

Information on patent family members

internatio	pplication No
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