



- (51) **International Patent Classification:**  

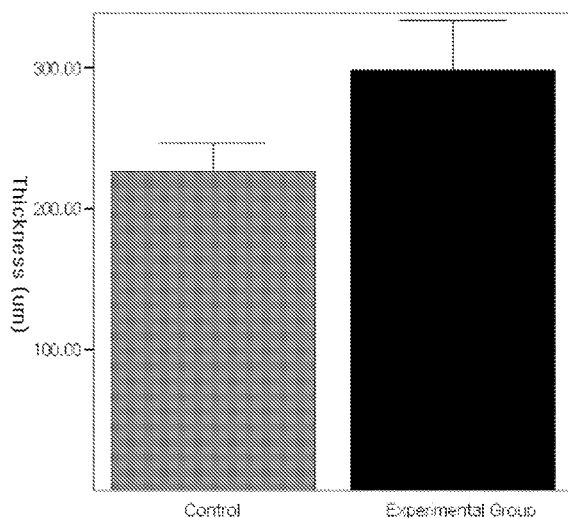
A61L 27/52 (2006.01)	A61L 27/40 (2006.01)
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- (74) **Agents:** RESNICK, David, S. et al; NIXON PEABODY LLP, 100 Summer Street, Boston, Massachusetts 021 10-213 1 (US).
- (81) **Designated States** (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, 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.
- (84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
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- (75) **Inventors/Applicants** (for US only): **MOONEY, David, J.** [US/US]; 27 Powers Road, Sudbury, Massachusetts 01776 (US). **KIM, Woo, Seob** [KR/KR]; 649 Gaepo-dong, Gangnam-gu, Gyungnam Apt.10-1403, Seoul 135-240 (KR).

[Continued on nextpage]

(54) **Title:** TISSUE ENGINEERING USING INJECTABLE, OXIDIZED ALGINATE HYDROGELS

7B



Figures 7A-7B

(57) **Abstract:** Disclosed herein is a cell implantation pre-matrix composition comprising oxidized high molecular weight alginate and oxidized low molecular weight alginate, for combination with cells and polymerization into a hydrogel. Also disclosed are methods of generating a tissue at a site in a subject by the administration of the hydrogel described herein. The generation of fat tissue in a subject by the methods described herein is envisioned.





## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2012/050876****A. CLASSIFICATION OF SUBJECT MATTER***A61L 27/52(2006.01)i, A61L 27/54(2006.01)1, A61L 27/50(2006.01)1, A61L 27/40(2006.01)1, C12N 5/071(2010.01)1*

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)

A61L 27/52; A61K 9/00; C08B 37/04; A61P 7/00; C07H 13/02

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) &amp; Keywords: HMW, LMW, alginate, cell implantation, growth factor, peptide, hydrogel.

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	HAO, X. et al., "Angiogenic effects of sequential release of VEGF-A165 and PDGF-BB with alginate hydrogels after myocardial infarction", Cardiovascular Research 2007, Vol. 75, 178-185. See Sections 2.1 & 2.2 on page 179.	1-9, 13
Y	US 2008-0085295 A1 (MELVIK, JAN EGIL et al.) 10 April 2008 See paragraphs [0036], [0049], [0057], [0058], [0069].	1-9, 13
Y	KONG, H. J. et al., "Quantifying the relation between adhesion ligand-receptor bond formation and cell phenotype", PNAS 2006, Vol. 103, 18534-18539.	13
A	See page 18538, left column, lines 65-66.	1-9
A	EP 0927196 B1 (THE REGENTS OF THE UNIVERSITY OF MICHIGAN) 05 November 2008 See paragraphs [0023], [0119], [0129], [0130]; claims 1, 4, 6.	1-9, 13

 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 application or patent 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 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

"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

27 FEBRUARY 2013 (27.02.2013)

Date of mailing of the international search report

**28 FEBRUARY 2013 (28.02.2013)**

Name and mailing address of the ISA/KR



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**Box No. 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.: **18-31**  
because they relate to subject matter not required to be searched by this Authority, namely:  
Claims 18-31 relate to a method for treatment of the human body, which is a subject matter this International Searching Authority is not required to search under PCT Article 17(2)(a)i and Rule 39.1(iv).
2.  Claims Nos.: **12, 17, 19, 24, 26-29, 31**  
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:  
Claims 12, 17, 19, 24, 26-29 and 31 are unclear because they refer to multiple dependent claim(s) which do not comply with PCT Rule 6.4.(a).
3.  Claims Nos.: **10, 11, 14-16, 18, 20-23, 25, 30**  
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:

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 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.

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/050876**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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