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- (71) **Applicant:** PURDUE RESEARCH FOUNDATION [US/US]; Office of Technology Commercialization, 1281 Win Henschel Blvd, West Lafayette, IN 47906 (US).
- (72) **Inventors:** LADISCH, Michael, Ralph; 1014 Kingswood Drive, West Lafayette, IN 47906 (US). KIM, Young, Mi; 2401 Queens Drive, Woodbury, MN 55125 (US).
- (74) **Agent:** TALEYARKHAN, Pervin, Rusi; Purdue Research Foundation, 1281 Win Henschel Blvd, West Lafayette, IN 47906 (US).
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(54) **Title:** METHODS FOR MITIGATING THE INHIBITORY EFFECTS OF LIGNIN AND SOLUBLE PHENOLICS FOR ENZYMIC CONVERSION OF CELLULOSE

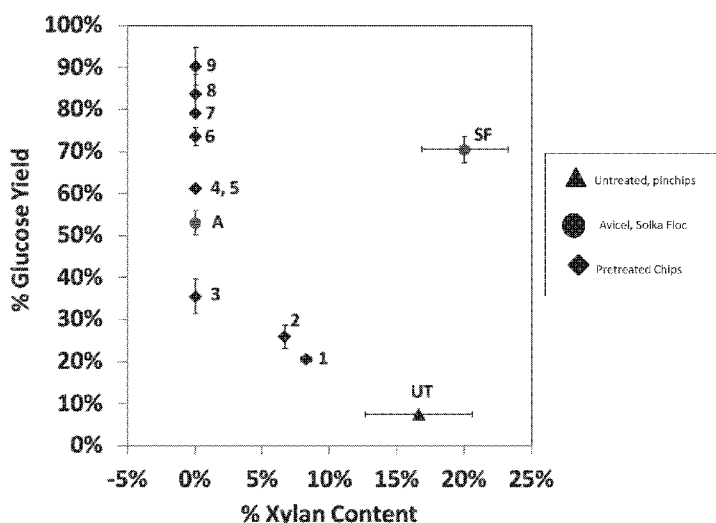


FIG. 1

(57) **Abstract:** Disclosed herein are methods for improving ethanol production from biomass sources by blocking cellulose from binding to lignin.

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## INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - C12P 7/10, 19/14; C12N 9/42 (2016.01) CPC - C12P 7/10, 19/14; C12N 9/2437 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8) Classification(s): C12P 7/10, 19/14; C12N 9/42 (2016.01) CPC Classification(s): C12P 7/10, 19/14; C13K 13/002; C12N 9/2437 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) PatSeer (US, EP, WO, JP, DE, GB, CN, FR, KR, ES, AU, IN, CA, INPADOC Data); Google Scholar; Google; EBSCO lignocellulose feedstock, cellulose, hemicellulose, lignin, enzyme, xylo-oligosaccharides, bovine serum albumin		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	WO 2010/029568 A2 (PRAJ INDUSTRIES LIMITED) 18 March 2010; page 2, lines 4-15, table; page 3, lines 19-24; page 4, lines 5-7, 25-27; page 5, lines 21-25; page 6, lines 20-24; page 8, lines 1-25; page 10, lines 13-14; page 11, lines 1-3; claim 1	1-3, 7-8, 15, 17, 28-32, 39-41, 44-45, 49-53 ---- 4-6, 9-14, 16, 18-27, 33-38, 42-43, 46-48, 54-81
X --- Y	WO 2010/121348 A1 (GREENFIELD ETHANOL INC.) 28 October 2010; page 2, lines 18-35; page 3, lines 1-7; page 5, lines 1-2; page 11, lines 21-22; claim 1	51 ---- 13-14, 33-34, 54-76
Y	US 6620292 B2 (WINGERSON, RC) 16 September 2003; column 5, lines 22-23; column 8, lines 40-43; column 6, lines 5-7	4-6, 9, 16, 18-27, 37
Y	US 2005/0065336 A1 (KARSTENS, T) 24 March 2005; paragraph [0047]; claim 32	10-12
Y	WO 2010/113130 A2 (CHEMTEX ITALIA S.R.L.) 7 October 2010; page 34, lines 6-9	35, 77-79
Y	WO 2005/024037 A2 (THE TRUSTEES OF DARTMOUTH COLLEGE) 17 March 2005; paragraphs [0030], [0034]-[0035], [0091]-[0092]	36, 38, 80-81
Y	WO 2013/165968 A1 (ARCHER DANIELS MIDLAND COMPANY) 7 November 2013; paragraphs [0004], [0022], [00102], [00104], [00114]	42-43, 46-48
Y	WO 2009/032200 A1 (FLUOR TECHNOLOGIES CORPORATION) 12 March 2009; page 2, lines 1-6, 19-24; page 8, lines 11-12; figure 1	6, 16, 18-27
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
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