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Published:

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

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(54) **Title**: BIOMASS SHOCK PRETREATMENT

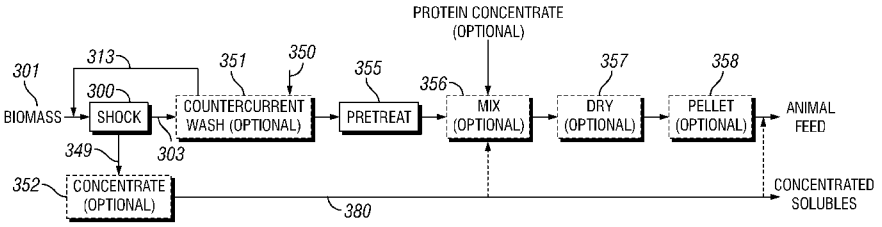

FIG. 3

(57) **Abstract**: Methods and apparatuses for treating biomass that may include introducing a biomass to a chamber; exposing the biomass in the chamber to a shock event to produce a shocked biomass; and transferring the shocked biomass from the chamber. In some aspects, the method may include pretreating the biomass with a chemical before introducing the biomass to the chamber and/or after transferring shocked biomass from the chamber.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/030998

A. CLASSIFICATION OF SUBJECT MATTER

C12P 1/00(2006.01)i, C12P 7/06(2006.01)i, C12M 1/00(2006.01)i

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)
C12P 1/00; D21C 1/04

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)
shock treatmetn, shock event, shock wave, biomass

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	KR 10-0325414 B1 (한국에너지기술연구원) 25 February 2002 See the whole document, especially claims 1 and 3.	1-4,7,8,18-20,23-29,32 5,6,9-17,21,22,30,31
A	KRISHNAN, C., et al. Alkali-Based AFEX Pretreatment for the Conversion of Sugarcane Bagasse and Cane Leaf residues to Ethanol. Biotechnology and Bioengineering, Octover 2010, Vol.107, No.3, pages 441-450. See the whole document.	1-32
A	ZHENG, Y., et al. Pretreatment for Celllulose Hydrolysis by Carbon Dioxide Explosion. Biotechnol. Prog., 1998, Vol.14, pages 890-896. See the whole document.	1-32
A	SUN,Y.,et al. Hydrolysis of lignocellulosic materials for ethanol production : a review. Bioresource Technology, 2002, Vol.83, pages 1-11. See the whole document.	1-32

☐ 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
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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
"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
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-0325414 B1	25.02.2002	None	