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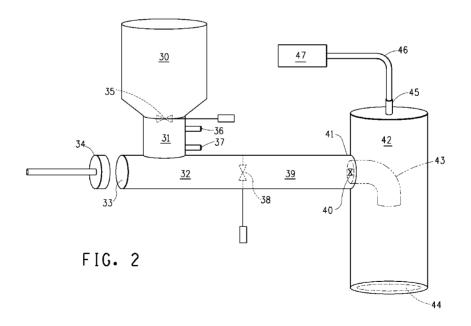
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19703 (US). ELANDER, Richard, T. [US/US]; 9229 S. William Cody Drive, Evergreen, Colorado 80439 (US). LYONS, Robert, C. [US/US]; 11232 West 67th Avenue, Arvada, Colorado 80004 (US). TUCKER III, Melvin, P. [US/US]; 2570 Garland Street, Lakewood, Colorado 80215 (US).

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[Continued on next page]

(54) Title: BIOMASS TREATMENT APPARATUS



(57) Abstract: An apparatus was developed for; treatment of biomass in which reactants are added to biomass and the biomass mixture is moved through the apparatus without compacting under force of a non- compacting piston (34). Treatment systems used in this reactor result in effectively treated biomass that is particularly suitable for subsequent saccharif ication to produce fermentable sugars.

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* 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 "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 "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 cannot be considered novel or cannot be considered to involve an inventive step when the 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. "8" document member of the same patent family Date of mailing of the international search report	X	BURKE MURRAY [CA]; AGOSTINO DENNI [CA];) 17 February 2000 (2000-02-	S D		26,27
"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 filling 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 "P" document published prior to the international filling date but later than the priority date claimed "Date of the actual completion of the international search "I later document published and not in conflict with the application but cited to understand the principle or theory underlying the invention cannot be considered novel or 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 mailing of the international search report			X See patent fa	mily annex.	
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18 June 2009 25/06/2009		actual completion of the international search 8 June 2009	Date of mailing of 25/06/2		earch report
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Fax: (+31–70) 340–3016 Authorized officer Cubas Alcaraz, Jose	Name and	European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040,			lose

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Information on patent family members

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