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(54) **METHODS OF PROCESSING ETHANOL BYPRODUCTS AND RELATED SUBSYSTEMS**

(56) **References Cited**

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- (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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ABSTRACT

In one aspect of the invention, a method recovers oil from a concentrated byproduct, such as evaporated thin stillage formed during a dry milling process used for producing ethanol. The method includes forming a concentrate from the byproduct and recovering oil from the concentrate. The step of forming the concentrate may comprise evaporating the byproduct. Further, the step of separating the oil from the concentrate may comprise using a centrifuge and, in particular, a disk stack centrifuge. Other aspects of the invention include related methods and subsystems for recovering oil from thin stillage.

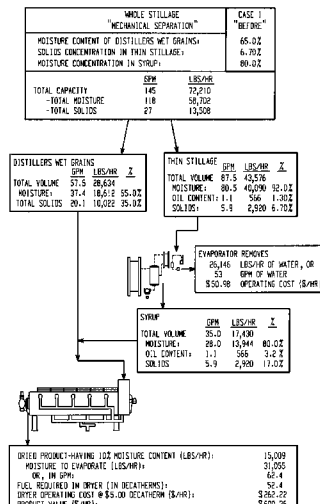
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C11B 7/00 (2006.01)
- (52) **U.S. Cl.** **554/177**
- (58) **Field of Classification Search** **554/177**
See application file for complete search history.



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Email from David Cantrell to Mike Stanley with Copy to Jay Sommers, entitled "Oil Recovery", dated Aug. 18, 2003; 1 page; Attachment to Email entitled, "VDT Oil Recovery System", dated Aug. 19, 2003 (3 pages); 4 total pages.

Email from David Cantrell to Gerald Winter and Jay Sommers with Copy to Mark Lauderbaugh, David Winsness, Whit Davis, Greg Barlage and Bent Ludvigsen entitled "Oil Recovery", dated Jun. 29, 2003; 1 page.

Email from David Cantrell to Gerald Winter and Jay Sommers entitled "VDS System Update", dated Jun. 5, 2003; 1 page; Attachment consisting of worksheet, 2 pages; (Email and Attachment, 3 pages total).

GS Cleantech Corporation; Plaintiff v. Adkins Energy, LLC, Defen-

Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 242; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS Cleantech Corporation; Plaintiff vs. *Amazing Energy, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 233; Case 1:10-ml-02181-LJM-DML 12 pgs.

GS CleanTech Corporation; Plaintiff vs. *Big River Resources Galva, LLC and Big River Resources West Burlington, LLC* Defendants; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 235; Case 1:10-ml-02181-LJM-DML 11 pgs.

GS Cleantech Corporation; Plaintiff vs. *Blue Fint Ethanol, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 238; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS CleanTech Corporation; Plaintiff vs. *Bushmills Ethanol, Inc.*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 243; Case 1:10-ml-02181-LJM-DML 14 pgs.

GS CleanTech Corporation; Plaintiff vs. *Cardinal Ethanol, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 236; Case 1:10-ml-02181-LJM-DML 11 pgs.

GS CleanTech Corporation; Plaintiff vs. *Cardinal Ethanol, LLC*, Defendant; “Answer of Cardinal Ethanol, LLC to Plaintiff GS CleanTech Corporation’s First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Mar. 15, 2012, Document 261; Case 1:10-ml-02181-LJM-DML 11 pgs.

GS CleanTech Corporation; Plaintiff vs. *Flotwegg Separation Technology, Inc.*, Defendant; “Second Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 237; Case 1:10-ml-02181-LJM-DML 12 pgs.

GS CleanTech Corporation; Plaintiff vs. *Adkins Energy, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 242; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS CleanTech Corporation; Plaintiff vs. *Iroquois Bio-Energy Company, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 240; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS CleanTech Corporation; Plaintiff vs. *Iroquois Bio-Energy Company, LLC*, Defendant; *Iroquois Bio-Energy Company, LLC*’s Answer and Affirmative Defenses to *GS CleanTech Corporation*’s First Amended Complaint for Patent Infringement; filed in the United States District Court for the Southern District of Indiana, Master Case

No. 1:10-ml-2181-LJM-DML, on Mar. 15, 2012, Document 259; Case 1:10-ml-02181-LJM-DML 11 pgs.

GS CleanTech Corporation; Plaintiff vs. *Lincolmland Agri-Energy, LLC*, Defendant; “Answer of Lincolmland Agri-Energy, LLC to Plaintiff GS CleanTech Corporation’s Second Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Mar. 15, 2012, Document 262; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS CleanTech Corporation; Plaintiff vs. *United Wisconsin Grain Producers, LLC*, Defendant; “First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 239; Case 1:10-ml-02181-LJM-DML 10 pgs.

GS CleanTech Corporation; Plaintiff vs. *Big River Resources Galva, LLC and Big River Resources West Burlington, LLC*, Defendants; “Answer of Big River Resources Galva, LLC and Big River Resources West Burlington, LLC to Plaintiff GS CleanTech Corporation’s First Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Mar. 15, 2012, Document 260; Case 1:10-ml-02181-LJM-DML 11 pgs.

GS CleanTech Corporation; Plaintiff vs. *Lincolmland Agri-Energy, LLC*, Defendant; “Second Amended Complaint for Patent Infringement”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Feb. 27, 2012, Document 241; Case 1:10-ml-02181-LJM-DML 10 pgs.

ICM; Plaintiff vs. *GS CleanTech Corporation*, Defendant; “Fourth Amended Complaint for Declaratory Judgement Jury Trial Requested”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Mar. 15, 2012, Document 255; Case 1:10-ml-02181-LJM-DML 10 pgs.

ICM; Plaintiff vs. *GS CleanTech Corporation*, Defendant; “Defendants GS CleanTech Corporation and Greenshift Corporation’s Motion to Dismiss ICM Inc’s Fourth Amended Complaint Pursuant to Fed. R. Civ. P. 12(B)(1) and 12(B)(6) or, Alternatively, to Transfer”; filed in the United States District Court for the Southern District of Indiana, Master Case No. 1:10-ml-2181-LJM-DML, on Apr. 18, 2012, Document 318; Case 1:10-ml-02181-LJM-DML 6 pgs.

ICM Inc, and *ICM-related Ethanol Plant Defendants Memorandum in Support of Their Motion for Summary Judgment of Non-Infringement*; filed in the United States District Court, Southern District of Indiana, Indianapolis, Division, in re: Method of Processing Ethanol Byproducts and Related Subsystems (‘858) Patent Litigation; Master Case No. 1:10-ml-02181-LJM-DML; dated May 23, 2012, 25 pages; Certificate of Service, 1 page (page 26).

Iroquois Bio-Energy Company LLC, Memorandum in Support of its Motion for Summary Judgment of Non-Infringement; filed on Jun. 4, 2012, in the United States District Court, Southern District of Indiana, Indianapolis, Division, in re: Method of Processing Ethanol Byproducts and Related Subsystems (‘858) Patent Litigation; Master Case No. 1:10-ml-02181-LJM-DML; Document No. 362; dated Mar. 23, 2012, 27 pages; Certificate of Service, 1 page (pages 28).

* cited by examiner

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