



US008962059B1

(12) **United States Patent**
Froderman et al.

(10) **Patent No.:** **US 8,962,059 B1**
(45) **Date of Patent:** **Feb. 24, 2015**

(54) **BIO-BASED OIL COMPOSITION AND METHOD FOR PRODUCING THE SAME**

(75) Inventors: **Christopher S. Froderman**, Avon, IN (US); **William C. Hildebrand**, Indianapolis, IN (US)

(73) Assignee: **Superior Oil Company, Inc.**, Indianapolis, IN (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 81 days.

(21) Appl. No.: **13/117,301**

(22) Filed: **May 27, 2011**

(51) **Int. Cl.**
C11B 3/16 (2006.01)
C11B 13/00 (2006.01)

(52) **U.S. Cl.**
USPC **426/601**; 554/206; 426/623

(58) **Field of Classification Search**
CPC C11B 1/10; C11B 13/00
USPC 426/601, 623; 554/204, 206
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,606,916	A *	8/1952	Darling et al.	554/10
2,663,718	A	12/1953	Strezynski	
4,702,798	A *	10/1987	Bonanno	159/47.1
5,250,182	A	10/1993	Bento et al.	
5,662,810	A	9/1997	Willgoos	
5,795,477	A	8/1998	Herman et al.	
6,433,146	B1	8/2002	Cheryan	
7,601,858	B2	10/2009	Cantrell et al.	
7,608,729	B2	10/2009	Winsness et al.	
2003/0180415	A1	9/2003	Stiefel et al.	
2004/0087808	A1	5/2004	Prevost et al.	

2005/0155282	A1	7/2005	Siggelkow et al.	
2006/0006116	A1	1/2006	Scheimann et al.	
2006/0041152	A1 *	2/2006	Cantrell et al.	554/8
2007/0210007	A1 *	9/2007	Scheimann et al.	210/728
2007/0238891	A1 *	10/2007	Winsness et al.	554/8
2008/0110577	A1	5/2008	Winsness	
2008/0125612	A1	5/2008	Bruckmayer	
2009/0227004	A1	9/2009	Dale	
2009/0293344	A1	12/2009	O'Brien et al.	
2012/0245370	A1 *	9/2012	Sheppard et al.	554/204

OTHER PUBLICATIONS

David G. Cooper, J.E. Zajic, Edward J. Cannel and Joan W. Wood. The Relevance of "HLB" to De-Emulsification of a Mixture of Heavy Oil, Water and Clay. The Canadian Journal of Chemical Engineering vol. 58, Oct. 1980; pp. 576-579.*
Hui Wang, Tong Wang, and Lawrence A. Johnson Effect of Low-Shear Extrusion on Corn Fermentation and Oil Partition. J. Agric. Food Chem. 2009, 57, 2302-2307.*
Singh, N. et al., "Extraction of Oil From Corn Distillers Dried Grains With Solubles," *Transactions of the ASABE*, vol. 41, No. 6, Nov./Dec. 1998, pp. 1775-1777.
"The HLB System A Time-Saving Guide to Emulsifier Selection," © 1976 ICI United States Inc., 22 pages.

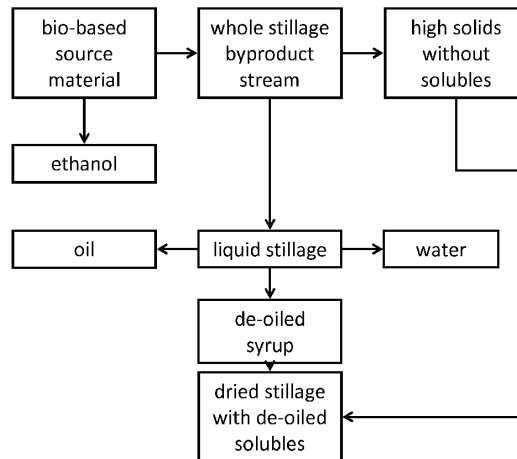
(Continued)

Primary Examiner — Humera Sheikh
Assistant Examiner — Subbalakshmi Prakash
(74) *Attorney, Agent, or Firm* — William F. Bahret

(57) **ABSTRACT**

A method of extracting oil from a byproduct stream of a bio-based ethanol production process and an organic composition resulting from the method is provided. The method includes applying an oil concentrator to a byproduct stream, mixing the oil concentrator with the byproduct stream, and separating the oil from the byproduct stream. An organic composition comprising oil derived from a byproduct stream of a bio-based ethanol production process and an oil concentrator is also provided.

16 Claims, 5 Drawing Sheets



(56)

References Cited

OTHER PUBLICATIONS

Becher, Paul, *Emulsions: Theory and Practice*, Reinhold Publishing, New York, c. 1957, Chapter 6, "The Chemistry of Emulsifying Agents," p. 209-265.

Watkins, Catherine, "Two Fuels From One Kernel," *Inform*, vol. 18, No. 11, Nov. 2007, pp. 714-718.

Lumisorb PSTS-20 K (Polysorbate 65) Technical Data Sheet, Lambent Technologies, c. 2006, 2 pages.

Lumisorb PSMO-20 K (Polysorbate 80) Technical Data Sheet, Lambent Technologies, c. 2004, 2 pages.

GreenShift Corporation Corn Oil Extraction Process Description, [online], © 2005-2010, [retrieved Nov. 17, 2010]. Retrieved from the Internet: <http://www.greenshift.com/cornoil.php?mode=2>, 2 pages.

FDA Part 172, Code of Federal Regulations Title 21, Part 172, [online], undated, [retrieved Dec. 3, 2012]. Retrieved from the Internet: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?CFRPart=172>, 5 pages.

* cited by examiner

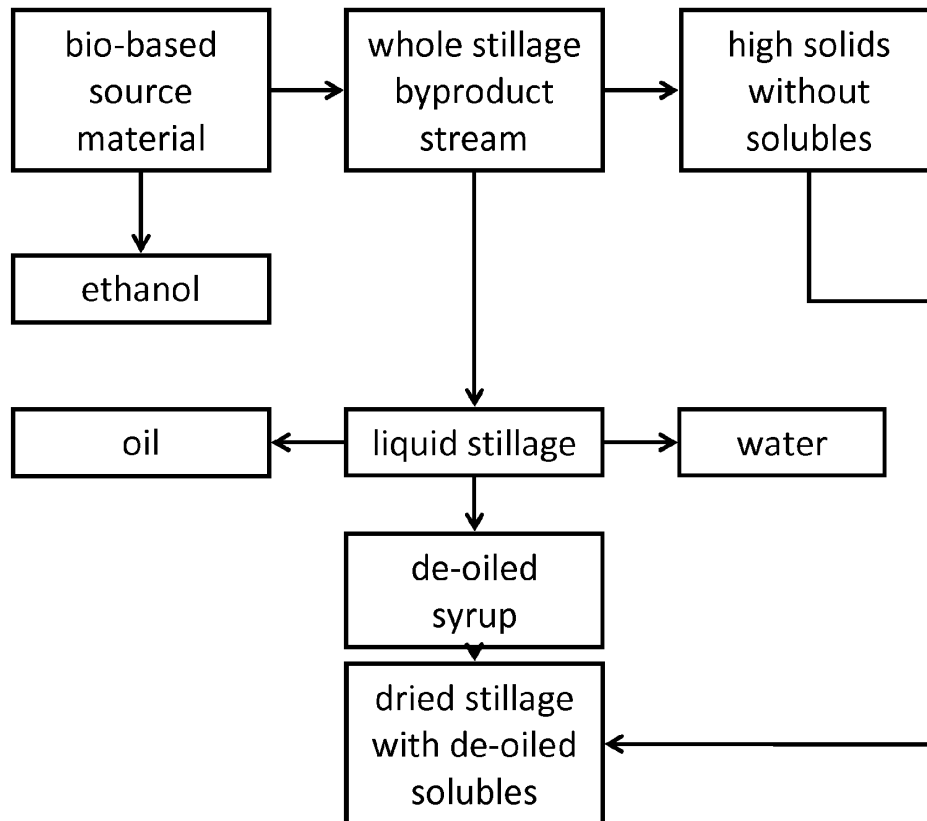


FIG. 1

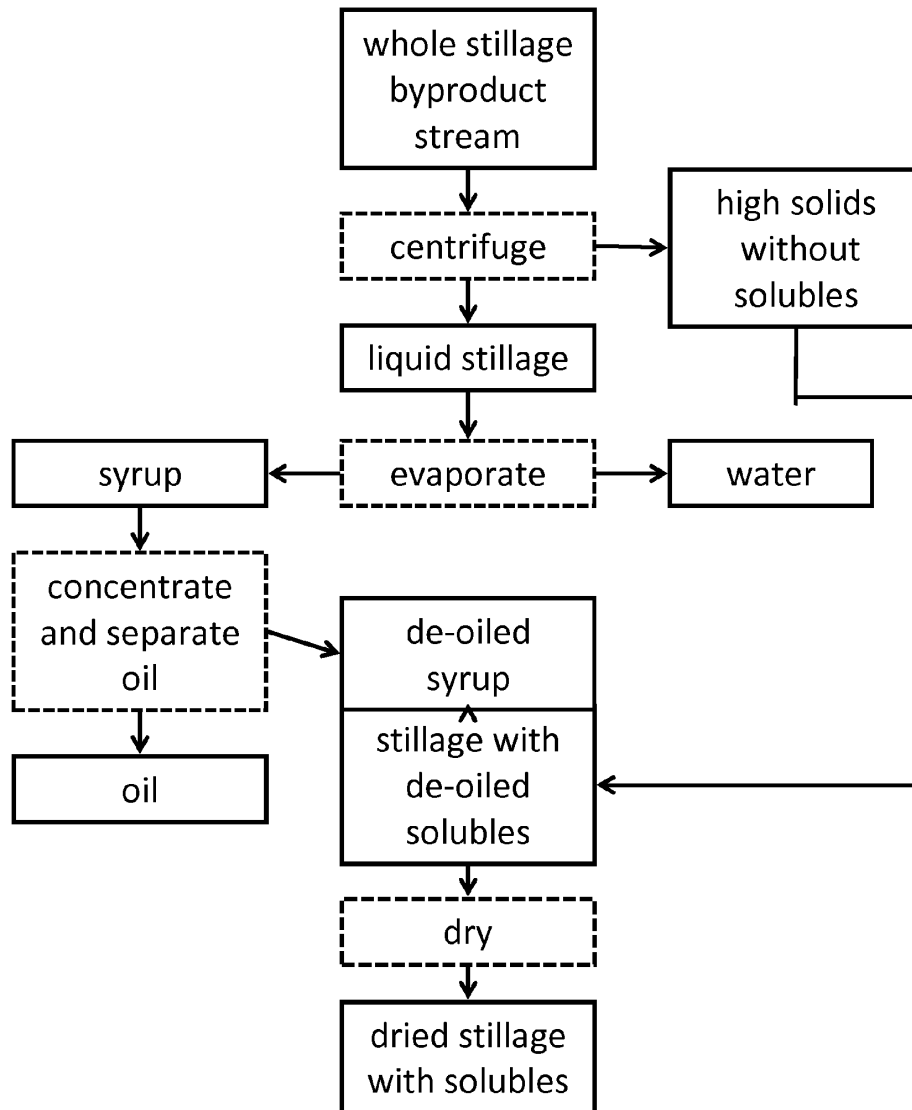


FIG. 2

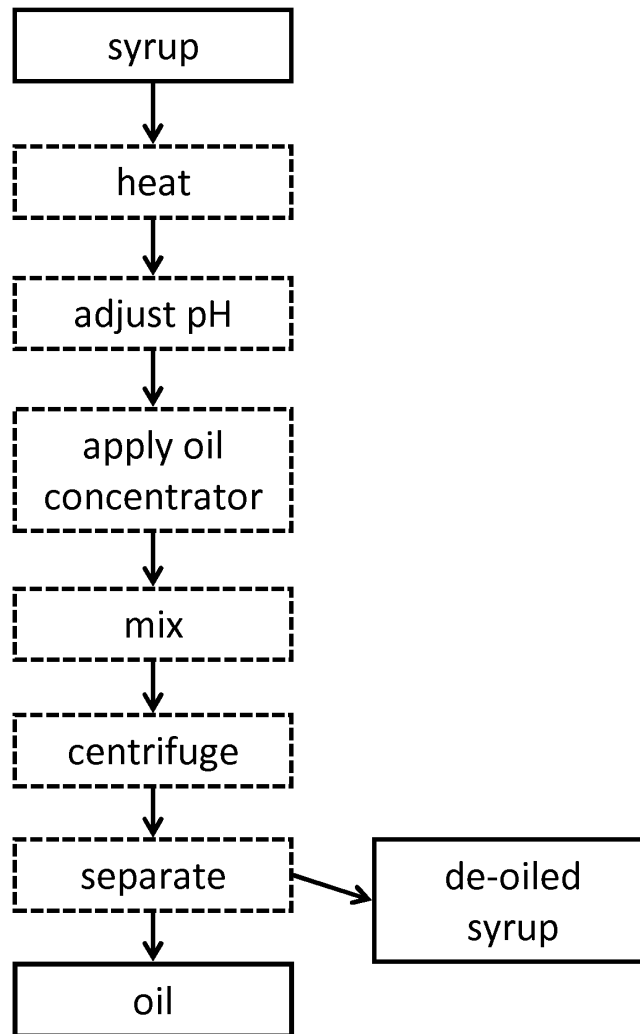


FIG. 3

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.