10/22/2018

Patent Valuation Report

OriginClear, Inc. Patent Portfolio

Estimated Value: U.S.$8,000,000

October 22nd, 2018

Cambridge Manhattan Group, LLC
5610 Scotts Valley Drive, B122
Scotts Valley
CA 95066

Attn: Jean-Louis Kindler
President, OriginClear Technologies
525 South Hewitt St
Los Angeles, CA 90013

Dear Jean-Louis,

Re: Valuation of the Patent Portfolio Held by OriginClear, Inc.

Further to your request that I conduct an appraisal of the patent assets held by OriginClear, Inc. ("Patents"), I hereby estimate the fair market value of this patent portfolio at US$8m. Having acted as a patent broker since 2003, authored books on I.P. valuation, and operated a patent exchange with more than 500,000 patents for sale, I reached this figure as a result of evaluating the patents, looking at the market growth projections for the water treatment industry, and comparing the portfolio with others that have recently sold on the marketplace. I support the valuation by considering the net present value of income streams that might be derived from potential licensing royalties. Of course, if the Patents were placed on the patent market for sale, and collect offers from multiple competing buyers, the price could increase above the $8m level. However, as far as the patent market goes, the water treatment sector is rather a specialist area, and we would not expect to see as many buyers as some other patent markets such as telecommunications or consumer electronics.

Patents in the OriginClear portfolio:

Country / Region	Title	Application/Patent number	Date filed
Japan	Systems, Apparatus and Methods for Obtaining Intracellular Products and Cellular Mass and Debris from Algae and Derivative Products and Process of the Use Thereof	PCT/US10/031756	October 19, 2011
Mexico	Systems, Apparatus and Methods for Obtaining Intracellular Products and Cellular Mass and Debris from Algae and Derivative Products and Process of the Use Thereof	MX/a/2011/011035	October 19, 2011
US	Systems and Methods for Extracting Non-Polar Lipids from an Aqueous Algae Slurry and Lipids Produced Therefrom	9,085,745	October 18, 2012
US	Removing Ammonia from Water	13/942,348	July 15, 2013
Japan	Systems and Methods for Harvesting and Dewatering Algae	2014-554963	July 28, 2014
Malaysia	Harvesting and Dewatering Algae Using a Two-Stage Process	2014703041	October 15, 2014
India	Harvesting and Dewatering Algae Using a Two-Stage Process	2073/MUMNP/2014	October 16, 2014
Mexico	Harvesting and Dewatering Algae Using a Two-Stage Process	MX/a/2014/012607	October 17, 2014
US	System for removal of suspended solids and disinfection of water	14/543,457	November 17, 2014

Malaysia	Producing Algae Biomass and Decontaminating Wastewater Utilizing a Series of Reactor Tubes with Mixed Metal Oxide Electrodes	PI2015703684	October 15, 2015
China	Producing Algae Biomass and Decontaminating Wastewater Utilizing a Series of Reactor Tubes with Mixed Metal Oxide Electrodes	201480022300.8	October 19, 2015
Indonesia	Producing Algae Biomass and Decontaminating Wastewater Utilizing a Series of Reactor Tubes with Mixed Metal Oxide Electrodes	P-00201507347	November 13, 2015
India	Producing Algae Biomass and Decontaminating Wastewater Utilizing a Series of Reactor Tubes with Mixed Metal Oxide Electrodes	7064/CHENP/2015	November 17, 2015
Hong Kong	Producing Algae Biomass and Decontaminating Wastewater Utilizing a Series of Reactor Tubes with Mixed Metal Oxide Electrodes	16102811.5	March 10, 2016
US	Systems and methods for reduction of total organic compounds in wastewater	15/172,010	June 2, 2016
PCT	Systems and methods for reduction of total organic compounds in wastewater		
Provisional	Advanced Oxidation Water Treatment Module		September 5, 2017
Provisional	Electrochemical Systems and Methods for Peroxide Production in Water Treatment	62/715,396	August 7, 2018
US	Advanced Oxidation Water Treatment Module	N/A (pending delivery of formal filing receipt)	September 4, 2018
PCT	Advanced Oxidation Water Treatment Module	N/A (pending delivery of formal filing receipt)	September 5, 2018

The most valuable patent portfolios have the following characteristics:

1. Fundamental inventions addressing large markets with high growth potential.
2. Multiple patent families with international counterparts and open continuations (child applications that can be developed into further patents).
3. Substantial royalty rates can be justified for licensing campaigns.
4. A track record of adoption of the technology in the market.
5. A track record of the Patents being successfully licensed.
6. Absence of low-price licensing obligations, which are common in areas where standards have been adopted and companies have agreed to FRAND (Fair, Reasonable and Non-Discriminatory) cross-licensing arrangements.

In this case, the OriginClear portfolio meets all the aforementioned criteria. The Patents cover a number of fundamental technologies that have proved effective at remediating various forms of waste water. The market for waste-water remediation technology is large and growing.

The Patents have been well constructed and designed to withstand the rigors of a legal challenge. Of course, no patent is immune from a legal challenge, but these appear to have been constructed in such a way as to provide a

strong defense against attack in inter-parte review or another procedure. As an example, I attach analysis we conducted on one of the exemplary patents (US9,085,745) from the OriginClear portfolio. Each patent family has open continuations that can be developed into further patent families and there are several international counterparts opening the door to the international market where the need for waste water remediation is large and growing.

The Patents have already been subject to license agreements with royalty rates ranging from 5% to 7%. These are very healthy royalty rates, especially considering that 1% is a rule-of-thumb rate often applied in the patent industry. I understand that the patents are not subject to any FRAND or other obligations that would prevent the Patents continuing to warrant healthy royalty rates in future.

As an active patent broker, representing buyers and sellers in patent sale and licensing transactions, I have insights into the current patent market and the prices that patents attract. The market, and prices, fell after the America Invents Act was adopted in 2011, however, since that time, I have personally brokered the sale (for sellers), and purchase (for buying clients) of a number of patent portfolios and one such portfolio acts as a good comparable here. Representing the seller, I brokered the sale of a family of 6 telecommunications patents that sold for $8.25m. That portfolio consisted of only one family of patents, and there were no international counterparts. However, the telecommunications market was large, and a strong royalty rate of 1.5% had been established in with a licensee. With a higher (5-7%) royalty rate, international counterparts and more diverse families, the Patents appear stronger than this $8.25m comparable but the buying activity in the telecommunications sector is more intense than the water treatment sector, and until patent wars break out in the water treatment industry, the number of potential buyers that could be matched with the Patents is relatively small. Hence the $8m valuation based on the comparables method, and my recent experiences in the patent marketplace.

When I run an income based valuation analysis, I see that an $8m valuation can be readily justified, even applying a conservative (25% +) discount rate. The water treatment market is so large, market growth projections so significant and the 5-7% royalty rate so substantial, that achieving a net present value of $8m can be readily achieved through the most conservative of assumptions.

I hope this valuation is satisfactory and wish you the best of luck commercializing these important technologies.

Best regards,

David Smith

Valuation & Appraisal Credentials:

- Founder and Chairman of Tynax, Inc., leading patent brokers, since 2003.
- Creator and Owner of the ValueMyPatent.com valuation service.
- J.D. Santa Clara University. BS Computer Science & Economics, University of Leeds.
- Acknowledged as one of the “World’s Leading I.P. Strategists” by International Asset Magazine (IAM 300).
- Author of several books including Dollar Value—The Valuation of Patents, Startups, Software and Other Intellectual Property Assets, Patents Cloaks & Daggers—Inside the Secretive Patent Trade, and Zero-To-IPO—a Roadmap & Travel Guide for High Tech Entrepreneurs.

Patent U.S. 9,085,745: Facts and Figures

Patent Title:	Systems and methods for extracting non-polar lipids from an aqueous algae slurry and lipids produced therefrom
USPTO Publication:	9,085,745
Original Application Number:	13/642096
Abstract:	Methods, systems, and apparatuses for extracting non-polar lipids from microalgae are achieved using a lipid extraction device having an anode and a cathode that forms a channel and defines a fluid flow path through which an aqueous slurry is passed. An electromotive force is applied across the channel at a gap distance in a range from 0.5 mm to 200 mm to cause the non-polar lipids to be released from the algae cells. The non-polar lipids can be extracted at a high throughput rate and with low concentrations of polar lipids such as phospholipids and chlorophyll.

Dates

Date Patent Was Filed:	19 Oct 2010
Priority Date:	.
Date Patent Issued:	21 Jul 2015
Years to Expiration (Estimated):	13.27
Age from Priority Claim:	7.02
Age Relative to Patents in Field:	1

Maintenance and Expiration

Expiration Status:	4yr fee payment window opens: ~7/21/2018
Maintenance Status:	4yr fee payment window opens: ~7/21/2018

Inventor, Assignees & Individuals

Inventor(s):	Eckelberry; Nicholas (Los Angeles, CA), Green; Michael Phillip (Pacheco, CA), Fraser; Scott Alexander (Manhattan Beach, CA)
Examiner:	Carr; Deborah D
Front Page Assignee:	OriginOil, Inc.
Current Assignee:	.
Assignee Location:	Los Angeles, CA
Assignment History:	Assignment: 1 Reel/Frame: 029742 / 0172 Recorded: 02/01/2013 Pages: 5 Conveyance: ASSIGNMENT OF ASSIGNORS INTEREST (SEE DOCUMENT FOR DETAILS). Assignors: Eckelberry, Nicholas Exec Dt: 12/20/2012; Green, Michael Exec Dt: 12/20/2012; Fraser, Scott Exec Dt: 01/15/2013

	Assignee: OriginOil, Inc. 5645 W. Adams Blvd, Los Angeles, California 90016 Correspondent: Jarod R. Marrott; 60 East South Temple, 1800 World Trade Center, Salt Lake City, UT 84145

Patent Classification

US Patent Classes:	1/1
US Class Description:	1/1:Top Level Class code not found
International Class(es):	C11B 1/00 (20060101); C11B 3/00 (20060101); A23D 9/02 (20060101); C11B 1/10 (20060101); C12M 1/00 (20060101); C12N 1/06 (20060101); C12N 13/00 (20060101); C02F 1/40 (20060101); B01D 57/00 (20060101); B01D 57/02 (20060101)

Claims of Patent U.S. 9,085,745

Words in Shortest Claim: 115

This patent's claims are above average. The length of the claims compares favorably with the bulk of patents in this field. The patent claims determine the scope of the rights the patent represents—it is primarily the claims that are assertable against infringers. The content and construction of the claims are key to determination of the patent's value. A patent with short, concise claims is considered more valuable than a patent with long claims. A patent with both method and apparatus claims is considered more valuable than a patent with either method or apparatus claims. A patent with several claims is considered more valuable than a patent with a single claim.

In this case, substantially all the key words forming the claims are defined in the specifications. In order to avoid a dispute as to the meaning of a word in the claims, it is good practice for each word in the claim to be described and defined in the specifications. If each of the key words is defined, this will add some value to the patent, if all the key words are not defined, this would enhance the possibility of the claim meaning being disputed by a potential infringer and reduce the value of the patent.

Claim 1:	1. A method for extracting non-polar lipids from microalgae in a flowing aqueous slurry, comprising: providing an aqueous slurry comprising microalgae; providing a lipid extraction apparatus having a body including a channel that defines a fluid flow path, wherein a cathode and an anode form at least a portion of the channel that defines the fluid flow path, the cathode and the anode being spaced apart to form a gap with a distance in a range from 0.5 mm to 200 mm within the channel; flowing the aqueous slurry through the channel and applying an electromotive force across the gap that compromises the microalgae cells and releases a lipid fraction having greater than 80 wt % non-polar lipids and less than 20 wt % polar lipids; and recovering at least a portion of the nonpolar lipid fraction.
Shortest Claim (if not claim 1):	CLAIM 11. A lipid extraction apparatus for extracting non-polar lipids from microalgae, comprising: a body including a channel that defines a fluid flow path from a first opening to a second opening, the first opening providing an inlet for an aqueous algae slurry and the second opening providing an outlet for the aqueous algae slurry; and a cathode, an anode, and an insulator forming at least a portion of the channel that defines the fluid flow path, the cathode and the anode being spaced apart to form a gap with a distance in a range from 0.5 mm to 100 mm, wherein a volume of the fluid flow path within the gap is at least 50 ml.

The claims in this patent do not use “means plus function” or other limiting language so the patent’s value is not reduced by limiting claims language. Broad claims are most valuable, and language that narrows the scope of the claim can reduce the value of the patent. “Means plus function” claims are restricted to the scenarios explained in the specifications, and they generally are deemed to narrow the scope of the patent. Other language in the claim can narrow the scope, especially when the scope is restricted to certain scenarios and situations.

Citations

Forward Citations:	4
Fwd Cit. Average Per Year:	1.8
Forward Citations Patent #s:	9719892; 9682378; 9675973; 9475042;
Backward Citations:	71
Backward Citations Patent #s:	1740659; 1988932; 3198119; 3315270; 3409530; 3479873; 3752747; 3985634; 4039422; 4169033; 4243751; 4253271; 4269690; 4437954; 4458524; 4681116; 4752740; 4981582; 5128304; 5511408; 5543034; 5614378; 5783052; 5804384; 5858199; 5866910; 5951875; 6269261; 6279611; 6391619; 6709560; 6912895; 6942767; 7136699; 7420658; 7510864; 7790427; 7824904; 8003379; 8105474; 20010011457; 20020079270; 20020123126; 20030113832; 20040067574; 20040096943; 20050170479; 20060141615; 20060163056; 20060172417; 20060240544; 20070056842; 20080160593; 20090029445; 20090047722; 20090087900; 20090104594; 20090105965; 20090127128; 20100050502; 20100081835; 20100120095; 20100151540; 20100170151; 20100233761; 20110095225; 20110107655; 20110308962; 20120021481; 20120094366; 20120129244;

Forward Citations—Citations to Patent U.S. 9,085,745

Number of Forward Citations: 4
Max. Annual Forward Citations: 4

The number of forward citations for this patent is above average. A forward citation is made when a new patent application cites this patent as prior art, acknowledging the existence of this patent, and differentiating the two inventions. A patent with a large number of forward citations, is generally considered more valuable than a patent with very few forward citations. The number of forward citations is helpful in determining value, but a patent with a large number of forward citations will have little value if the claims are weak. So, the impact of the forward citations on value is not as significant as the impact of the strength of the claims.

Backward Citations—Citations by Patent U.S. 9,085,745

Number of Backward Citations: 71

The number of backward citations for this patent is unusually high. This adds some value to the patent. When this patent was filed, prior art was identified by the patent examiners and by the inventor. The patent was distinguished from the prior art, as the patent examiner determined that the prior art was insufficiently close to this invention to render it unpatentable. A substantial number of backward citations, indicates that the inventor and the examiner did some research to uncover prior art that might render this patent invalid. Each backward citation is deemed to have a small impact on the value of the patent, increasing the value slightly. This is a factor to help assess the value of the patent, but this is not very significant in the overall valuation.

Forward Citation Table

Patent	Patent Title	Assignee	Inventor
9719892	Processing device for processing a highly viscous sample	**Paratus Diagnostic, LLC**	Carrano; John (San Marcos, TX), Schneider; Roland (San Marcos, TX)
9682378	Mating adaptor for coupling a point-of-care diagnostic cartridge to a computing device	**Paratus Diagnostics, LLC**	Carrano; John (Austin, TX), Schneider; Roland (Austin, TX), Carrano; John Jacob (Austin, TX)
9675973	Specimen delivery apparatus	**Paratus Diagnostics, LLC**	Carrano; John C. (Austin, TX), Schneider; Roland (Austin, TX), Carrano; John J. (Austin, TX)
9475042	Specimen delivery apparatus	**Paratus Diagnostics, LLC**	Carrano; John C. (Austin, TX), Schneider; Roland (Austin, TX), Carrano; John J. (Austin, TX)

Backward Citation Table

Patent	Patent Title	Assignee	Inventor
3752747	Issue Date: August 14, 1973		
3985634	Electrolytic silver recovery apparatus		Larson; Kay R. (Pomona, CA), Drew; John (Richmond, CA), Ott; Howard (Great Neck, NY)
4039422	Metal recovery unit		Packer; Elliot L. (Plainfield, NJ)
4169033	Electroplating cell	**RKC Corporation**	Dunagan; Kenneth M. (Oklahoma City, OK)
4243751	Electrochemical process and apparatus to control the chemical state of a material	**Massachusetts Institute of Technology**	Swartz; Mitchell R. (Malden, MA)
4253271	Mass algal culture system	**Battelle Memorial Institute**	Raymond; Lawrence P. (Richland, WA)
4269690	Electrolytic apparatus for reclaiming dissolved metal from liquid	**Hammond; Nancy Swartz**	Graham, III; James M. (Westminster, MD)
4437954	Fuels production by photoelectrolysis of water and photooxidation of soluble biomass materials	**Institute of Gas Technology**	Sammells; Anthony F. (Naperville, IL), St. John; Michael R. (Chicago, IL)
4458524	Crude oil production stream analyzer	**Texaco Inc.**	Meador; Richard A. (Spring, TX), Paap; Hans J. (Houston, TX)

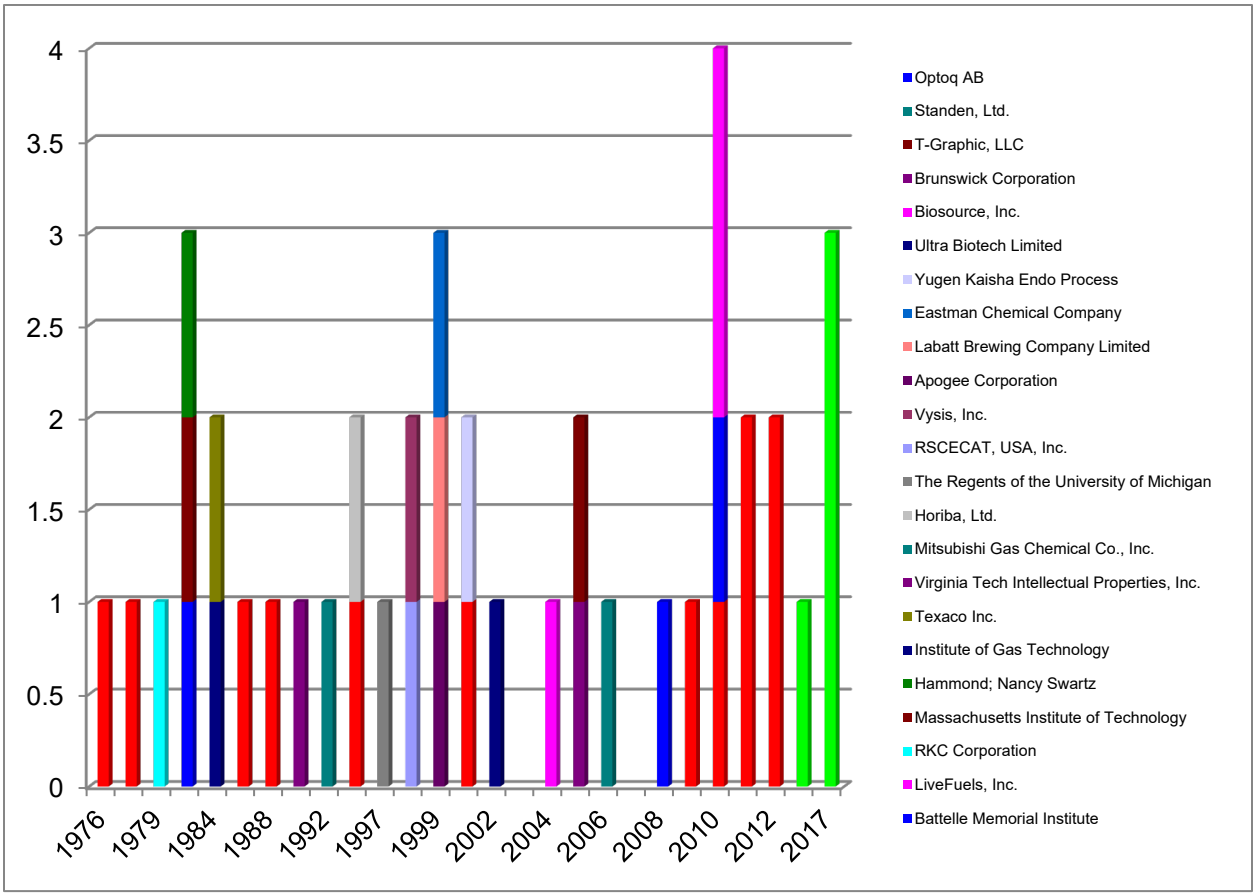
4681116	Antimony electrode assembly and method of manufacture, and use thereof		Settler; Bert (Winnipeg, Manitoba, CA)
4752740	Electronic water chemistry analysis device with linear bargraph readouts		Steininger; Jacques M. (Santa Barbara, CA)
4981582	Process and apparatus for separating fine particles by microbubble flotation together with a process and apparatus for generation of microbubbles	**Virginia Tech Intellectual Properties, Inc.**	Yoon; Roe-Hoan (Blacksburg, VA), Adel; Gregory T. (Blacksburg, VA), Luttrell; Gerald H. (Blacksburg, VA)
5128304	Catalyst for alkylation of phenols	**Mitsubishi Gas Chemical Co., Inc.**	Ito; Muneo (Tsukuba, JP)
5511408	Automatic calibrating apparatus for laboratory ion concentration meter	**Horiba, Ltd.**	Yoshioka; Nobuki (Kyoto, JP), Ohkawa; Hiromi (Kyoto, JP)
5543034	Method of enhancing the growth of aquatic organisms, and structures created thereby		Hilbertz; Wolf H. (Baily, Co. Dublin, IE), Goreau; Thomas J. (Chappaqua, NY)
5614378	Photobioreactors and closed ecological life support systems and artifificial lungs containing the same	**The Regents of the University of Michigan**	Yang; Victor C. (Ann Arbor, MI), Bartlett; Robert H. (Ann Arbor, MI), Palsson; Bernhard O. (Ann Arbor, MI), Javanmardian; Minoo (Naperville, IL)
5783052	Electrochemical cell	**RSCECAT, USA, Inc.**	Bakhir; Vitold M. (Moscow, RU), Zadorozhny; Jury G. (Moscow, RU)
5804384	Devices and methods for detecting multiple analytes in samples	**Vysis, Inc.**	Muller; Uwe Richard (Plano, IL), Lane; David J. (Wheaton, IL)
5858199	Apparatus and method for electrocoriolysis the separation of ionic substances from liquids by electromigration and coriolis force	**Apogee Corporation**	Hanak; Joseph J. (Ames, IA)
5866910	Flow-through photo-chemical reactor	**Labatt Brewing Company Limited**	Cooke; Jeffrey A. (Brewster, NY), Austin; Glen D. (London, CA), McGarrity; Michael Jerome (London, CA)
5951875	Adsorptive bubble separation methods and systems for dewatering suspensions of microalgae and extracting components therefrom	**Eastman Chemical Company**	Kanel; Jeffrey Scott (Kingsport, TN), Guelcher; Scott Arthur (Weirton, VA)
6269261	Health care instrument containing oxidation-reduction potential measuring function	**Yugen Kaisha Endo Process**	Ootomo; Yoshitaka (Fujisawa, JP)
6279611	Apparatus for generating microbubbles while mixing an additive fluid with a mainstream liquid		Uematsu; Hideto (Iruma City, Saitama Prefecture, JP), Eckelberry; Nicholas (Los Angeles, CA)
6391619	Methods and compositions for suppressing growth of algae	**Ultra Biotech Limited**	Cheung; Ling Yuk (Hong Kong, HK)
6709560	Charge barrier flow-through capacitor	**Biosource, Inc.**	Andelman; Marc D. (Worcester, MA), Walker; Gregory S. (Grafton, MA)

6912895	Coolant flow monitoring system for an engine cooling system	**Brunswick Corporation**	Jaeger; Matthew W. (Stillwater, OK)
6942767	Chemical reactor system	**T-Graphic, LLC**	Fazzina; David (Littleton, CO), Matthews; Jack (Littleton, CO), Taracevicz; Steve (Santa Monica, CA)
7136699	Apparatus for destroying dividing cells	**Standen, Ltd.**	Palti; Yoram (Haifa, IL)
7420658	Method and device for measurements in blood	**Optoq AB**	Petterson; Magnus (Linkoping, SE), Dahlstrom; Anna (Linkoping, SE), Petterson; Hans (Linghem, SE)
7510864	Decision-making spectral bioreactor		Krichevsky; Micah I. (Wheaton, MD), Seiden; Steven A. (Washington, DC), Seiden; Louis W. (North Bethesda, MD), Butz; Sam (Gaithersburg, MD), Epstein; Marc J. (Leonardo, NJ)
7790427	Method of treating biocells	**Battelle Memorial Institute**	Chauhan; Satya P. (Columbus, OH), Usinowicz; Paul J. (Powell, OH)
7824904	Photobioreactors for production of algae and methods therefor		Dimanshteyn; Felix (West Hartford, CT)
8003379	High density bioreactor system, devices, and methods	**Brightsource Energy, Inc.**	Goldman; Arnold J. (Jerusalem, IL), Kagan; Michael (Jerusalem, IL), Kokotov; Yuri (Ma'aleh Adumim, IL)
8105474	Photo-electro-refining of bio-oil to biofuel and hydrogen	**Gas Technology Institute**	Fan; Qinbai (Chicago, IL)
20010011457	Apparatus and method for resource recovery from organic substance		Shishido, Hiromu; (Hiroshima-shi, JP); Omoda, Norio; (Hiroshima-shi, JP)
20020079270	Microalgae separator apparatus and method		Borodyanski, Genady; (Nesher, IL) ; Konstantinov, Irina; (Nesher, IL)
20020123126	Methods And Compositions For Suppressing Growth Of Pathogenic Microbes		Cheung, Ling Y.; (Hong Kong, HK)
20030113832	Apparatus and method for assaying electrophysiological effects		Lauf, Robert J.; (Oak Ridge, TN)
20040067574	Isolation of microbial oils		Bijl, Hendrik Louis; (Vlaardingen, NL); Schaap, Albert; (Barendrecht, NL)
20040096943	Method and device for cultivating of cells at high densities and for obtaining of products from these cells		Marx, Uwe; (Berlin, DE) ; Riedel, Marco; (Berlin, DE) ; Bushnaq-Josting, Hikmat; (Berlin, DE)
20050170479	Method for producing lipids by liberation from biomass		Weaver, Craig A.; (Boulder, CO) ; Kobzeff, Joseph.; (Charlottesville, VA); Behrens, Paul W.; (Ellicot City, MD); Fichtali, Jaouad; (Lexington, KY) ; Bell, Rebecca M.; (Crownsville, MD)
20060141615	Vegetable alga and microbe photosynthetic reaction system and method for the same		Lu; Chao-Hui; (Hsin Chu City, TW)

20060163056	Spiral electrodeionization device with uniform operating characteristics		Grebenyuk; Vladimir; (Woburn, MA) ; Grebenyuk; Oleg; (Ashland, MA) ; Sims; Keith J.; (Wayland, MA) ; Carson; William W.; (Hopkington, MA); MacDonald; Russell J.; (Wilmington, MA) ; Zhang; Li; (Belmont, MA)
20060172417	Cell cultivation and breeding method		Rathenow; Jorg; (Eppstein, DE) ; Kunstmann; Jurgen; (Bad Soden, DE) ; Ban; Andreas; (Darmstadt, DE) ; Asgari; Soheil; (Wiesbaden, DE)
20060240544	Bioreactor for growing fungus, plant cell, tissue, organ, hairy roots and plantlet	**Agricultural Research Institute**	Shiau; Yih-Juh; (Taichung, TW)
20070056842	Process for production of hydrogen from anaerobically deomposed organic materials	**World Hydrogen Energy, LLC.**	Roychowdhury; Sukomal; (San Diego, CA)
20080160593	Two-stage process for producing oil from microalgae		Oyler; James R.; (Salt Lake City, UT)
20090029445	Algae growth system for oil production		Eckelberry; Nicholas; (Los Angeles, CA) ; Eckelberry; T. Riggs; (Los Angeles, CA)
20090047722	SYSTEMS, DEVICES, AND METHODS FOR BIOMASS PRODUCTION	**BIONAVITAS, INC.**	Wilkerson; Brian D.; (Boise, ID) ; Chen; James C.; (Bellevue, WA) ; Pulse; John; (Woodinville, WA) ; Guschin; Andrei; (Issaquah, WA) ; Weaver; Michael; (Woodinville, WA)
20090087900	Apparatus for Performing Electrodistention on Algae Cells		Davey; Kent; (Austin, TX) ; Hebner; Robert E.; (Austin, TX)
20090104594	Bioreactor Process Control System and Method	**Biogen Idec**	Webb; Marcus; (Poway, CA)
20090105965	Method for determining the ignitability of fuel with an unknown fuel quality	**Robert Bosch GmbH**	Birk; Manfred; (Oberriexingen, DE) ; Scheidt; Michael; (Stuttgart, DE) ; Rupp; Andreas; (Marbach, DE)
20090127128	Membrane-electrode assembly, electrolytic cell employing the same, electrolytic-water sprayer, and method of sterilization	**Permelec Electrode LTD.**	KITAORI; Noriyuki; (Hachioji-shi, JP); SEKIDO; Kota; (Sagamihara-shi, JP) ; SHIBATA; Tomoyasu; (Fujisawa-shi, JP) ; SUZUKI; Tomohisa; (Fujisawa-shi, JP) ; TANAKA; Masashi; (Fujisawa-shi, JP); FURUTA; Tsuneto; (Fujisawa-shi, JP); NISHIKI; Yoshinori; (Fujisawa-shi, JP)
20100050502	Systems and methods for hydrothermal conversion of algae into biofuel	**LiveFuels, Inc.**	Wu; Benjamin Chiau-pin; (San Ramon, CA) ; DeLuca; Charity Ann; (San Mateo, CA); Payne; Emma Kathryn; (Belmont, CA)

20100081835	Systems and methods for producing biofuels from algae	**LiveFuels, Inc.**	Wu; Benjamin Chiau-pin; (San Ramon, CA) ; Stephen; David; (Davis, CA) ; Morgenthaler; Gaye Elizabeth; (Woodside, CA) ; Jones; David Vancott; (Woodside, CA)
20100120095	Electromagnetic bioaccelerator		Stroiazzo-Mougin; Bernard A. J.; (El Campello(Alicante), ES) ; Gomis Catala; Cristian; (El Campello(Alicante), ES)
20100151540	Method for processing an algae medium containing algae microorganisms to produce algal oil and by-products		Gordon; Roman; (Studio City, CA) ; Gorodnitsky; Igor; (Marina del Rey, CA) ; Grichko; Varvara; (Riverside, CA)
20100170151	Aquaculture Harvesting, Gas Exchange, and Media Circulation Device and Method of Use		Huber; Matthew Peter; (Carlsbad, CA)
20100233761	Algae biomass fractionation		Czartoski; Thomas J.; (Dexter, MI) ; Perkins; Robert; (Cecil, OH) ; Villanueva; Jorge L.; (Dexter, MI) ; Richards; Glenn; (Bakersfield, CA)
20110095225	Systems, apparatuses, and methods for extracting non-polar lipids from an aqueous algae slurry and lipids produced therefrom	ORIGIN OIL, INC.	Eckelberry; Nicholas D.; (Los Angeles, CA) ; Green; Michael Philip; (Pleasant Hill, CA) ; Fraser; Scott Alexander; (Manhattan Beach, CA)
20110107655	Pulsed electric field (PEF) method for continuous enhanced extraction of oil and lipids from small aquatic plants		Kempkes; Michael Alan; (Westford, MA) ; Roth; Ian; (Westford, MA) ; Gaudreau; Marcel Pierre Joseph; (Lexington, MA)
20110308962	Bio-Energy Reactor		Eckelberry; Nicholas; (Los Angeles, CA) ; Green; Michael; (Pacheco, CA)
20120021481	Electromechanical lysing of algae cells	BOARD OF REGENTS, THE UNIVERSITY OF TEXAS SYSTEM	Hebner; Robert E.; (Austin, TX) ; Davey; Kent; (Edgewater, FL) ; Werst; Michael D.; (Manor, TX) ; Connelly; Rhykka; (Austin, TX)
20120094366	Reconfigurable chemical process systems		LUDWIG; Lester F.; (Belmont, CA)
20120129244	Systems, methods and apparatuses for dewatering, flocculating and harvesting algae cells		Green; Michael Phillip; (Pacheco, CA) Eckelberry; Nicholas; (Los Angeles, CA) ; Fraser; Scott; (Manhattan Beach, CA) ; Goodall; Brian; (Los Angeles, CA)

Citations Graph



Age of Patent U.S. 9,085,745

Date of Filing: 19 Oct 2010
Years Until Expiration: 13.27

This particular patent is relatively new and is not yet approaching expiration. As a general rule, when the patent has expired, or determined invalid, its value is reduced to zero. Asserting a patent against an infringer can take several years, as a result of the slow speed at which the cases proceed through court. So, as a patent approaches the final few years before expiration, its value falls significantly.

Relative Age of Patent U.S. 9,085,745

Relative Age: 1

This patent was relatively late to the field. It was pre-dated by other patents. By the time this patent was filed, the claims allowable by the patent examiners was relatively narrow. A patent filed early in a field of technology can have broader claims and more value than a patent filed later. Like a land-grab in real-estate, as time proceeds and more patents are issued within a field, the new patents essentially fill the gaps left by the earlier patents. A patent filed early in the field will generally have broader claims that a later-filed patent, and hence has a higher value.

Family of International Counterparts for Patent U.S. 9,085,745

Number of International Family Members:	2
International Counterparts:	EP2561049; WO2011133181

This patent does not have sufficient international counterparts to add value to the U.S. patent. Patents are country-specific. A U.S. patent can be asserted only in relation to the U.S. market. International counterparts sold together, can add value to a U.S. patent. So, a U.S. patent with counterparts in major countries is considered more valuable than a U.S. patent without international counterparts.

Family of U.S. Child Patents and Applications for Patent U.S. 9,085,745

Number of Family Members:	1
Family Members:	9085745

This patent has a strong group of family members in terms of related U.S. patents. Patents sold in logical portfolios are more valuable than individual patents, as the chance of invalidation of a single patent is much higher than the chance of invalidation for a portfolio containing numerous related patents. A patent with child-applications, part of a larger family will be considered more valuable than a patent standing alone. If the patent is sold with open continuations, child patent applications with claims that can be molded by the acquirer, the value of the patent will be enhanced.

Figures and Definitions in Patent U.S. 9,085,745

Number of Figures: 16

This patent features a good set of drawings to help describe the invention. In order to avoid a dispute as to the meaning of a word in the claims, it is good practice for each word in the claim to be described and defined in the specifications. If each of the key words is defined, this will add some value to the patent, if all the key words are not defined, this would enhance the possibility of the claim meaning being disputed by a potential infringer and reduce the value of the patent.

Drawings and other figures can help explain elements of the patented invention, help clarify the meaning of the claims and can affect valuation. The effect on valuation not significant, but a patent with numerous figures will be worth slightly more than if no figures were provided.

Value and “Sell-ability”

As patents are all unique, the number of potential buyers for a particular patent can be very few, and finding the matching buyer can take some time. Based on patent trading activity in this sector, the chance of selling this patent following a 9 month period of marketing by a professional patent broker is estimated to be 25%.

Licenses to the Patent

The valuation provided in this report assumes the patent has not been licensed. If the patent has been licensed, the a royalty stream will be collectable by the buyer, please let us know of the licensing arrangement, as an

alternative form of valuation can be used to value the patent in this situation. Such valuation will be based on the net present value of the future royalties the patent will generate.

If the patent has been licensed, and there are no royalties collectable by a buyer, the value of the patent can be significantly reduced. The valuation here assumes there are no licenses, liens or encumbrances affecting clean title to the patents.

If evidence of use of the patent has been collected, identifying the potential infringers, and assessing the potential royalties that might be awarded by a court in a patent litigation program, please let us know, as an alternative form of valuation can be used in this situation. Such valuation will be determined by calculating the potential recovery from a licensing and assertion program.

Patent Valuation—Not Business Valuation

This valuation applies to the patent you provided for evaluation. If the patent is a component of a business selling products that incorporate the patented invention, then the business should be valued separately based on commonly accepted business and cash-flow valuation methodologies. The most accurate aggregate valuation estimate is achieved by estimating the value of the business, without considering the patents, then estimate the value of the patents, without considering the value of the business, then adding the value of the patents to the value of the business. The patent is a right to exclude others from using the patented invention, and the patents value is driven by the ability to extract royalties from infringers, so the value of the patent is determined by looking outside the company owning the patent—looking at the activities of competitors. So, the value of the patent can, and should, be separated from the value of the business owning the patent if a realistic value is to be determined. For a description of common business valuation methodologies, we recommend you view the following slideshow presentation: http://www.svbs.co/Public/SampleLecture/index.aspx.

Notes on the Effects of Patent Expiration

When a patent expires, on account of non-payment of maintenance fees, or for another reason, the patent is invalid and has no value at all. So the value attached to a patent can evaporate the moment the patent expires or is invalidated by the court or by the patent office examiners. Some consider patents to be somewhat fragile assets due to the fact that the value can evaporate entirely upon the patent's expiration or invalidation.