VT BIOMASA
PATENTES
13
Vigilancia Tecnológica
3er trimestre 2014

INVENCIONES ESPAÑOLAS EN EL SECTOR DEL BIOGÁS

Para realizar este estudio se han considerado las solicitudes de invenciones publicadas[1] desde 1948 hasta 2013 de los residentes en España, las invenciones cubren tanto las patentes como los modelos de utilidad. Se han contabilizado 77 invenciones que se mueven alrededor del sector del biogás y que aparecen listadas en la Tabla 1.

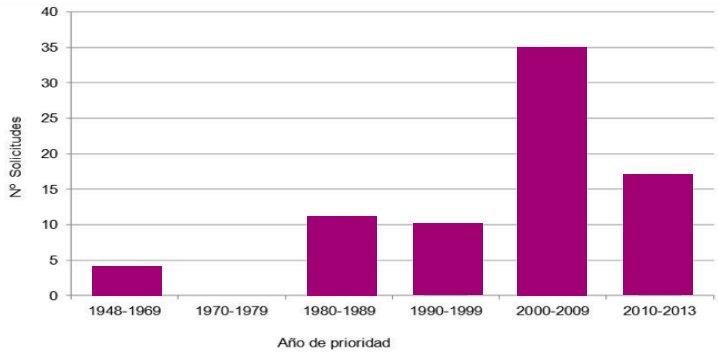

Figura 1: Evolución del número de invenciones relacionadas con el biogás para las que se solicitó protección

En la Figura 1, se muestra la evolución temporal de las invenciones, teniendo en cuenta la fecha de prioridad. Aunque la tecnología relacionada con el sector del biogás no es muy nueva (las solicitudes entre 1900 y 2000 corresponden al 32% de las invenciones) el crecimiento exponencial ha tenido lugar a partir del año 2000, siendo importante señalar que los datos correspondientes al periodo 2010-2013 pueden aumentar ya que es probable que existan invenciones para las que se ha solicitado protección en ese periodo pero de las que aún no se hayan publicado sus solicitudes. La primera solicitud encontrada data de 1948 y es solicitada por D. Alfredo Lago Giménez y D. Federico Fernández Kuntz (Tabla 1). En ella se solicita la protección de un procedimiento de obtención del gas metano y abonos orgánicos y minerales simples y compuestos. El 40% de las solicitudes reivindican la protección de equipos, sistemas o digestores para el tratamiento de residuos orgánicos, el 13% procesos para la purificación del biogás, principalmente la eliminación de H_2S y cabe destacar que el objetivo del 3% de las solicitudes es la obtención de hidrógeno. Con respecto a la matería prima utilizada el 30% están enmarcadas dentro del tratamiento de aguas residuales, lodos y fangos mientras que solo el 14% se refieren al tratamiento de residuos sólidos urbanos.

Para el 20% de las invenciones, además de la solicitud nacional, se realizó solicitud internacional. En el 93% de las solicitudes internacionales se expresó el deseo de obtener la patente europea.

El análisis de las solicitudes en función del tipo de solicitante se refleja en la Figura 2. Como se puede apreciar, la participación más importante corresponde a las empresas (45%) y a las personas físicas (35%). Los principales solicitantes son la Universidad de Valladolid y la Universidad de Cádiz (Tabla 1). Desde la perspectiva de la cooperación, se desprenden unos níveles muy bajos, como lo demuestra el hecho de que el número de estas no supera la cifra de 10 (Tabla 1).

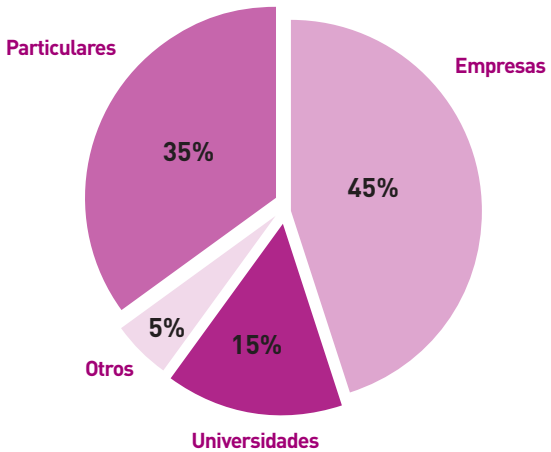

Figura 2: Naturaleza de los solicitantes españoles de patentes en el área del Biogás

[1]FUENTES: Espacenet e Invenes

Tabla1:

PATENTES RELACIONADAS CON EL SECTOR DEL BIOGÁS (PERIODO 1900-2013) TÍTULO DE LA PATENTE, Nº DE PUBLICACIÓN DE LA SOLICITUD			
Nº	Título	Nº Publicación	Solicitante
1	Procedimiento para la obtención de hidrógeno a partir de biogás de vertedero de residuos sólidos urbanos	ES2490066	- Agencia de Medio Ambiente y Agua de Andalucia - Natural Connections and Consulting, S.L.
2	Method for the valorisation of photosynthetic microorganisms for integral use of biomass	WO2014122331	- Algaenergy, S.A. - Univ. Almería
3	Un procedimiento y dispositivo para la producción de gas metano	ES0199468	Almandoz Irazoqui, J.M.
4	Equipo para tratamiento anaerobio de vertidos de alta carga organica	ES8300651	Aplicaciones Técnicas Industriales, S.A.
5	Sistema para el aprovechamiento del biogás producido por materia orgánica contenida en un depósito	ES8603783	Bercero Borderias, J.A.
6	Método de generación de energía térmica y eléctrica a partir de residuos diversos y sistema para su puesta en práctica	ES2366249	Berlanga Jiménez, J.
7	Equipo para depuración biológica de aguas residuales	ES2301370	- Biotratamientos de Aguas, S.L - Valdés García, J
8	Sistema para el tratamiento de purines de cerdo	ES2308875	Bledeng, S.A.
9	Sistema de depuración simultánea de biogás y efluentes residuales industriales mediante microalgas y bacterias	ES2372509	Biogás Fuel Cell, S.A.
10	Tratamiento de uurines mediante desnitrogenación y degradación de materia orgánica	ES2200648	CARTIF
11	Procedimiento biológico para la eliminación de H2S de un gas	ES2302466	Casals Cardona Ind, S.A.
12	Procedimiento para la disminución de la concentración de dióxido de carbono en biogás	ES2367731	CSIC
13	Unit and method for improving the biodegradability of sources of organic material	WO2014125133	De Andrés García, P
14	Digestor anaerobio de actividad central para los procesos de biometanización de residuos y efluentes de carácter orgánico	ES8502728	- Empresa Nacional Adaro de Investigaciones Mineras, S.A. - Ministerio de Agricultura, Pesca y Alimentación. Dirección General de la producción Agraria
15	Biofiltro con soporte orientado, aplicable a procesos de biometanización de residuos y efluentes de carácter orgánico	ES2006909	
16	Procedimiento para la obtencion de hidrogeno y metano a partir de residuos organicos	ES2388025	Endesa, S.A.
17	Sistema de obtención de bio-gas, de aplicación preferencial en la calefacción de granjas avícolas	ES8801083	Energías Orgánicas
18	Procedimiento e instalación para la depuración de residuos contaminantes	ES495266	Felipe Pineda, S.A.
19	Metodo para el tratamiento de aguas residuales e instalacion para llevar a cabo dicho metodo	ES2315178	Ferrer Polo, J Seco Torrecillas, A Bouzas Blanco, A Serralta Sevilla, J Ribes Bertomeu, J García Usach, F
20	Biogas production	WO2012123331 31 EP2683662	-Fundacio Privada Inst. Catala de Nanotecnologia -Institucio Catalana de Recerca i estudis Avancats -Univ. Auton. Barcelona
21	Aparato para la obtención de gas metano	ES252223	Garmendia Auzmendi, J
22	Filtro para la depuración de gases combustibles	ES1020921	Gas Natural SDG, S.A.
23	Un aglomerado de óxidos de hierro para la absorción del ácido sulfhidríco presente en el biogás	ES2051638	

PATENTES RELACIONADAS CON EL SECTOR DEL BIOGÁS (PERIODO 1900-2013)
TÍTULO DE LA PATENTE, Nº DE PUBLICACIÓN DE LA SOLICITUD

Nº	Título	Nº Publicación	Solicitante
24	Sistema de eliminacion de impacto ambiental por olores de balsas de residuos líquidos	ES2334873	Grande Grupo Andaluz de Estudios
25	Digestor anaeróbico tubular vertical	ES1014504	- Guerrero Villaroel, F. - Díaz de Barrionuevo, A - Cortijo Martínez, M - Mesa Peña, A
26	Procedimiento y aparato de purificación y concentración de biogás para su aplicación como gas energético	ES2299289	HERA AMASA, S.A.
27	Proceso de digestión anaerobia, en dos fases, de fangos procedentes de la depuración de aguas residuales con contenido orgánico	ES2088368	Hernández Muñoz, A.
28	Procedimiento de fermentación anaerobia combinada de residuos sólidos urbanos y lodos urbanos	ES2199022	
29	Digestor perfeccionado para fermentación anaerobia del estiércol	ES0268374	Industrias Energéticas, S.A.
30	Procedimiento de obtención del gas metano y abonos orgánicos y minerales simples y compuestos		Lago Giménez, A.
31	Equipo de depuración biológica de aguas residuales con digestión anaeróbica hidrolítica y metanogénica	ES2229920 WO2005021447	Lalanne Participaciones Empresariales, S.A.
32	Procedimiento de agitado mediante la presión generada por la digestión anaerobia de fluidos orgánicos y biodigestor concebido para ello	ES2464240	López Díaz, J.M.
33	Procedimiento para aumentar la eficiencia en la difestión anaerobia de residuales de alta carga orgánica	ES2179737	Macías Flores, S.
34	Procedimientos e instalación para el tratamiento de purines en explotaciones ganaderas	ES2167222	MEYME,S.A.
35	Sistema para la extracción y llenado de agua de un sistema anaerobio de depuración de agua por lotes	ES2300164	NILO Medio Ambiente, S.L.
36	Procedimiento y dispositivo para reciclaje y valorización de residuos domésticos biodegradables producidos en viviendas de comunidades de vecinos mediante plantas de producción de biogás para producir electricidad, abono y calentar agua	ES2410261 WO2010100309	Núñez Jaramillo, A.
37	Procedimiento de destrucción de los residuos urbanos y caseros	ES0263405	Nitris Española, S.A.
38	Perfeccionamientos en digestores para el tratamiento de residuos organicos	ES8207102	Nuevas Energías, S.A.
39	Procedimiento con su dispositivo para producción de gas metano	ES8400722	Pallas Arisa, C
40	Procedimiento para la descontaminación de residuales líquidos de alta carga orgánica y nitrogenada	ES2323211	Pérez Pardo, J.L García Ribera, D
41	Sistema para el tratamiento de residuos sólidos urbanos	ES2187325	Polanco López Lavin, J
42	Digestor para tratamiento aerobio y anaerobio de residuos orgánicos	ES2388966	- Plana González-Sierra, R - Pérez Losada, C
43	Procedimiento para tratamiento de purines de ganado porcino	ES2155754	- Recuperación de Energía, S.A. - Aplicaciones de Tecnologías Ambientales, S.A.
44	Método y reactor para tratamiento fermentativo de lixiviados procedentes de vertederos y plantas de tratamiento de residuos sólidos urbanos y utilización del líquido resultante como abono para plantas	ES2261048	Romero Batallán, C.
45	Método para aislamiento y control de vertederos de residuos y de aprovechamiento/extracción del biogás resultante y la correspondiente instalación	ES2023591	
46	Procedimiento de explotación de una instalación de biometanización de residuos sólidos orgánicos e instalación para llevarlos a cabo	ES2403279T EP2407255 WO2010103138	

PATENTES RELACIONADAS CON EL SECTOR DEL BIOGÁS (PERIODO 1900-2013)
TÍTULO DE LA PATENTE, Nº DE PUBLICACIÓN DE LA SOLICITUD

Nº	Título	Nº Publicación	Solicitante
47	Procedimiento para la biometanización de residuos sólidos urbanos, e instalación para la puesta en práctica de dicho procedimiento	ES2209613	Ros Roca Internacional, S.L.
48	Perfeccionamiento en las instalaciones para la biometanización de residuos sólidos urbanos	ES2249960	
49	Depurados AFADS (unidad compuesta Anaerobica continua a flujo vertical + Fitodepurador + Aireación mecánica + Destilador Solar) para tratamiento de aguas residuales urbanas, industriales o agrícolas	ES2318986	Rosato, M.A.
50	Procedimiento para la obtención de gas metano	ES8502667	Salvadó Sardá, F.
51	Procedimiento para reducir la carga contaminante de los purines	ES2199092 EP1683766 WO2005028382	SENER Grupo de Ingeniería, S.A.
52	Procedimiento para la depuración y el secado de purines	ES2157779	Servicios de Gestión Tecnológica, S.A.
53	Procedimiento para la depuración de purines	ES2223295	
54	Procedimiento y planta para el tratamiento de residuos con alta carga orgánica y elevado contenido en humedad	ES2183680	SINAE Energía y Medio Ambiente, S.A.
55	Procedimiento de tratamiento de fangos residuales	ES2362852 WO2012164122	SOCAMEX, S.A.
56	Reactor y sistema de integración energética para la hidrólisis térmica o termoquímica en continuo, de materia orgánica	ES2341064 EP2213631 WO2009010622	Sociedad General de Aguas de Barcelona, S.A.
57	Procedimiento de tratamiento de residuos de carácter orgánico en presencia de sepiolita	ES541333	TOLSA, S.A.
58	Reactor biológico integrado de lecho fijo ordenado	ES2212895	Univ. Burgos
59	Procedimiento y planta para la digestión anaerobia termofílica-mesofílica secuencial de lodos mixtos de depuradora	ES2430739	Univ. Cádiz
60	Sistema automatizado para la eliminación de sulfhídrico del biogás producido en plantas de aguas residuales, con recuperación biológica del reactivo	ES2129351	
61	Pretratamiento biológico de residuos sólidos orgánicos	ES2328212 WO2009135967	
62	Reactor biológico para la oxidación de Fe (II) a Fe (III)	ES2180428 WO02090270	
63	Procedimiento de digestión anaerobia en fases de temperatura de los residuos sólidos urbanos	ES2385167 WO2012085300	
64	Sistema para el desarrollo simultaneo de ensayos de biodegradabilidad	ES2272157 WO2006111598	
65	Procedimiento para la degradación de residuos acuo-oleosos con biomasa inmovilizada	ES2264883 WO2006108902	
66	Procedimiento para la gestión integral del estiércol de ganado vacuno lechero	ES2292277	Univ. Cantabria
67	Un procedimiento para la obtención de hidrógeno y metano a partir de biorresiduos	ES2292312	Univ. León
68	Reactor biológico de membranas de tres etapas, metanogénica, aerobia y de filtración, para la depuración de aguas residuales	ES2385002	Univ. Santiago de Compostela
69	Sistema integrado de reactor anaerobio metanogénico y biorreactor de membrana para la eliminación de materia orgánica y nitrógeno en aguas residuales	ES2401445 WO2014118416	
70	Proceso biológico anaerobio para el tratamiento de residuos o aguas residuales que contengan compuestos oxidados de azufre y materia nitrogenada	ES2161123	Univ. Valladolid

PATENTES RELACIONADAS CON EL SECTOR DEL BIOGÁS (PERIODO 1900-2013) TÍTULO DE LA PATENTE, Nº DE PUBLICACIÓN DE LA SOLICITUD			
Nº	Título	Nº Publicación	Solicitante
71	Equipo y procedimiento para la determinación y actividad metanogénica de fangos, biodegradabilidad de muestras sólidas y líquidas y toxicidad/inhibición de compuestos	ES2268925	Univ. Valladolid
72	Instalación y procedimiento para la biometanización de materia orgánica	ES2289886	
73	Sistema microaerobio para controlar la concentración de sulfuro de hidrógeno en reactores de biometanización	ES2442244 WO2014009575	
74	Sistema flotante para la captación de biogás	ES2368634	Univ. Vigo
75	Equipo para depuracion biologica de aguas residuales	ES2393772	Valdés García, J F
76	Dispositivo para la generación de metano a partir de residuos orgánicos	ES1041421	Villamarín Rodríguez, J.
77	Multi-compartment device for the treatment of vertical flow wastewater	WO2014114378 ES2479343	Zufiaur Fernandez de Beto, A

*Solo se recogen, la solicitud española, internacional y europea

ANÁLISIS DE PATENTES

Durante el tercer trimestre de 2014 se han identificado en la base de datos WPI (World Patent Index) 1.476 familias de patentes sobre tecnologías de conversión de la biomasa para la producción de energía (Tabla 2). El 53% de las referencias encontradas están relacionadas con las tecnologías bioquímicas y el 37%.con termoquímicas. La tecnología de digestión anaeróbica es la que cuenta con mayor número de resultados, 38% de los totales, seguida de la gasificación/pirólisis (20%).

Tipos de tecnologías de conversión de la biomasa	3er trimestre. 2014
Tecnologías termoquímicas	550
Combustión directa	256
Gasificación/pirólisis	294
Tecnologías bioquímicas	783
Digestión anaeróbica	564
Fermentación de azúcares	219
Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)	143
Nº TOTAL FAMILIAS DE PATENTES	**1.476**

Tabla 2. Número de familias de patentes clasificadas por tecnologías

En la Tabla 3 se muestran los países que tienen 20 o más solicitudes. El país líder es China con 664 solicitudes de patente, en segundo lugar, y con gran diferencia, le siguen las solicitudes internacionales (PCT). En tercero y cuarto lugar se encuentra Corea y EE.UU.con 179 y 169 solicitudes, respectivamente.En España durante este trimestre se han realizado 9 solicitudes.

En los apartados posteriores se recoge una selección de los documentos de patentes identificados en el trimestre analizado.

	País	Nº referencias
1	China (CN)	664
2	Patente PCT (WO)	260
3	Corea (KR)	179
4	EE.UU. (US)	169
5	Japón (JP)	75
6	Alemania (DE)	63
7	Patente Europea (EP)	49
8	Polonia (PL)	30
9	Rusia (RU)	29
10	Francia (FR)	20

Tabla 3. Ranking por países.

TECNOLOGÍAS TERMOQUÍMICAS
Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
EP2778526	RIENER KARL STEFAN (AT)	**View door of a heating device and heating device equipped with the same.** The vision door has a panel safety unit which is provided with a mechanical coupling element between a support element and a vision panel. The panel safety unit extends the coupling element between the support element and the vision panel in a bridge-shaped manner. The coupling element is rigidly fixed on the support element or to the vision panel. Use: Vision door for a heating device of combustion door for combustion of an energy source, particularly of biomass (Claimed), in biomass stoves, particularly stoves or pellet stoves.
EP2775210		**Oven.** The furnace has a combustion chamber having a convection heat region for generating convection heat from a heat radiation area for radiating generated heat in combustion chamber to heat the air of heat radiation area with the radiated heat. The furnace has two operating states, and in the first operating state, a fan is operated to direct warm air from heat region by convection to the outside environment, and in the second operating state, the fan is operated to direct the warm air partially into the remote area of furnace. Independent claims are included for the following: a heating system; and a method for controlling heating system. Use:Furnace such as firewood oven or pellet oven used in heating system (all claimed) for combustion of logs or pellets in residential environment.
EP2770255	MAGGALE ANTON (AT) et al	**Method for combustion of fuel.The method involves detecting water content of a fuel.** A supply of fuel having high water content is increased, and a supply of fuel having low water content is reduced by taking into account of the energy content of the fuel. A proportion of primary air and/or secondary air in the combustion air are selected depending on the detected water content of the fuel. The proportion of primary air is increased and the proportion of the secondary air is reduced for the fuel having high water content while reducing a proportion of a recirculation gas in the combustion air.
EP2770263	THEOBALD S A A (FR)	**Method and installation for heating water.** The method involves considering set point temperature of water circuit in output of a boiler and measuring effective water temperature of the circuit. Ignition information of a boiler stove is sent to a regulator based on detection that the stove is active. The burner is turned off or reduced according to value of difference between the temperatures. Outlet water temperature of the stove is measured, and wooden need of the stove is calculated according to the boiler temperature, stove temperature and the set point temperature. The need is indicated by an indication unit. An independent claim is also included for a water heating installation. Use: Method for heating water to produce domestic hot water in a living space by using a boiler stove.
EP2767759	STEP TRUTNOV A S (CZ)	**Boiler and method of feeding of fuels, particularly straw bales in the boiler.**A biomass combustion boiler, particularly firing full biomass bales, contains a pre-heating chambe and a combustion chamber. A closing plate is located outside the pre-heating chamber, in its basic position, and is insertable into the pre-heating chamber. In its inserted position it divides the pre-chamber into a lower space freely connected with the combustion chamber and an upper space for newly supplied fuel. Fuel, particularly full straw bales, is supplied to the boiler by first inserting closing plat into the pre-heating chamber, by then opening of a drop gate of the pre-heating chamber and inserting the fuel into the pre-heating chamber. The drop gate of the pre-heating chamber then closes and finally, the closing plate is removed from the pre- heating chamber. A pusher pressure piston conveys parts of the fuel from the bottom of pre-heating chamber into the combustion chamber. Use: Boiler used for combustion of biomass such as big cube straw or hay bales
EP2762777 (	STEP TRUTNOV A S (CZ)	**Boiler.** Boiler for burning whole bales of biomass, the boiler containing a combustion chamber and a heat exchanger, said combustion chamber containing a waste-gas flue arranged in its top section and where the inlet of waste gases into the waste-gas flue is arranged on the side of the combustion chamber which is opposite to the side with at least one intake supplying the combustion chamber with combustion air. Use: Boiler i.e. biomass-burning boiler, for burning biomass e.g. big cylinder-shaped bales of straw or hay, corn and grass, and culm plants.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014126268	THOMAS GIJUT-SUKENKYUJO CORP (JP)	**Smokeless, odorless, dustless incineration device.** Provided is a device for incinerating discarded material such as everyday garbage, unwanted rubber products, and plastics, without generating smoke, odors, or dust. An incineration material, which has been placed on a fire grating of an incineration furnace, is incinerated without generating smoke, odors, or dust, by controlling an incineration material combustion burner and an exhaust gas combustion burner and a mist nozzle provided in an exhaust gas collective outflow port, and an air supply blower used for cooling the exhaust gas, and, as needed, by controlling a blower used for burning the incineration material. This control is performed using a high-output signal (H) or a proportional control signal (P) transmitted from a smoke concentration sequencer controller of a smoke concentration instruction converter, which is provided on the exhaust gas outlet side of an exhaust gas cooling tower provided at the exhaust gas collective outflow por of the incineration furnace. Use: Smokeless odorless non-dust incineration equipment for incinerating discarded material such as organic refuse, wastepaper, wood chip, rubber goods, plastics from home, office or construction field
WO2014118419	FUNDACIÓN PRODINTEC (ES)	**Outside heater supplied with biomass pellets.** The invention relates to an outside heating device having an energy supply source in the form of biomass pellets, said device consisting of: at least one casing containing at least one combustion chamber for pellets supplied from at least one container through at least one pipe; at least one flame-lighting system; at least one combustion air inlet opening into the at least one chamber; at least one air inlet; at least one air outlet for the air-conditioning of the environment; and at least one chimney for releasing the smoke and gases produced during combustion to the exterior of the casing. Use: Heating device i.e. stove, for use in leisure area, bar and restaurant.
EP2762819	KEIML OTTO (AT)	**Burners for solid fuels with rotatable combustion tube.** The device has a rotatable combustion tube designed as a combustion chamber. An outlet is provided for delivery of flames and combustion gases. An air guide housing is provided above the combustion tube, and sealed on an outlet side towards the tube. The tube is rotatably mounted on rollers or gear wheels in a support housing, where one of the wheels is driven. Force transfer from the driven rollers to the tube is carried out in form-fit manner by teeth. Rear closure of the tube is carried out by a rear closure plate. The tube is periodically rotated during combustion. Use: Combustion device i.e. burner, for use at a furnace, heat-exchanger and boiler for combustion of solid fuels such as wooden pellets and wood chips (all claimed). Can also be used for combustion of pellets of plant wastes.
WO2014116125	YU JULIAN G (PH)	**Insulated firebrick oven for wood, charcoal, gas or other biomass materials.** This invention relates to an insulated firebrick oven adapted for using wood, charcoal, gas or other biomass materials for cooking bread, cookies, roasted meat, pizzas and the like that includes a moveable stand having an anchoring member; and a combustion chamber assembly removably held on top of said anchoring member and having an insulated firebrick food compartment provided with a chimney and an inside heat balancer, and further having a slidably mounted pull-out firebox provided with a pull-out ash tray. Use: Insulated firebrick oven for using wood, charcoal, gas or biomass material for cooking bread, cookie, roasted meat and pizza.
EP2759767	ALSTOM TECHNOLOGY LTD (CH)	**A reactor chamber for a circulating fluidized bed boiler.** A circulating fluidized bed boiler reactor chamber comprises a circulating fluidized bed grate for combustion of a fuel in the reactor chamber under fluidized conditions, and a material inlet duct for transporting fuel into the reactor chamber and further to the grate. The grate is provided with at least a first particle extraction device for discharge of non-combustible objects from the grate . The at least a first particle extraction device is arranged within a first target zone located on the grate. The position of the first target zone is based on at least one trajectory path (ST1, ST2) of a non-combustible object entering the reactor chambervia the material inlet duct.
WO2014111089	OHLER MISCHA (DE)	**Radiant heater.** The invention relates to a radiant heater for outdoor use, in particular for balconies, patios or gardens, preferably with the same shape and design as an umbrella heater and comprising a heat source that radiates heat. Said heater is characterised in that the heat source is designed as a combustion device for solid combustible material, i.e. wood, charcoal or coal.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014102427	VILLORIA OTERO DOMINGO AQUILINO (ES)	**Appliance for generating hot air from biomass.** The invention relates to an appliance for generating hot air from biomass, comprising a furnace and a burner supplied with biomass by means of an auger feed and a hopper, where connection tubes are provided on the furnace, that connect said furnace to an exchanger arranged thereon, in such a way that they form a single structure, with sheet metal walls lined with an insulator and a turbine that circulates the air therein and towards the building to be heated. The connection tubes connect the furnace and the exchanger by means of mobile connections. The exchanger is formed from a plurality of tubes with a solids decanter provided with a chimney outlet at the end of said tubes. The hopper comprises a rotary stirrer. Use: Appliance for generating hot air in an outdoor of a heating system for a livestock, an industrial ship and a building
WO2014105736	AIR LIQUIDE (FR), et al	**Biomass combustion method and system.** Improved combustion of biomass is achieved by injected first and second streams of biomass from a burner where the first stream of biomass has a median particle size larger than the biomass of the second stream and oxygen is injected with the first stream to provide an oxygen-enriched environment around the larger median sized particles. The oxygen-enriched environment is achieved either by injecting the oxygen directly into the first stream or by premixing the oxygen with the conveying air of the first stream. Use: Method for combusting biomass such as wood pellets, straw, hog fuel, crushed olive stones, dried sewage sludge and wood dust
ES1109505	BONET BADIA JOSÉ ANTONIO (ES)	**Estufa de astillas de madera.** 1.Estufa de astillas de madera, que comprende un depósito en cuya parte inferior está dispuesto un dosificador que regula la caída de las astillas de madera hacía una cámara de combustión, la cámara de combustión conforma un hogar donde las astillas de madera quedan dispuestos sobre una parrilla o quemador para su combustión, un cenicero está dispuesto en la parte inferior de la parrilla o quemador, unas entradas de aire primario y de aire secundario están conectadas a la cámara de combustión cuyo extremo de salida posee comunicación fluida con un intercambiador de calor, en donde es aprovechado el contenido energético de los gases de escape de la combustión de las astillas de madera, caracterizada porque el intercambiador de calor comprende una pluralidad de tubos convectores; dispuestos en paralelo entre la cámara de combustión y un colector de gases, la salida de los gases que circulan por cada tubo convector es regulada por sendos difusores variables que aceleran la combustión de los gases, así como, su extracción de la estufa a través de una boca de salida conectada al colector de gases. 2. Estufa según la reivindicación 1, en la que la transferencia de calor en el intercambiador se lleva a cabo por convección natural. 3. Estufa según la reivindicación 1, en la que el intercambiador de calor comprende cuatro tubos convectores. 4. Estufa según la reivindicación 1, en la que los difusores variables son regulados, de forma conjunta o independiente, por medios mecánicos accionados manualmente desde el exterior de la estufa. 5.; Estufa según la reivindicación 1, en la que la parrilla o quemador es de acero refractario. 6. Estufa según la reivindicación 1, en la que la parrilla o quemador comprende una porción principal en forma de rejilla, sobre la cual se soportan las astillas para su combustión, y una porción de agarre que facilita la extracción de la parrilla o quemador delhogar. 7. Estufa según la reivindicación 1, en la que la entrada de aire primario está conformada por sendas ranuras dispuestas en el depósito y en el hogar respectivamente. 8. Estufa según la reivindicación 7, en la que las ranuras comprenden medios de regulación de entrada de aire. 9.; Estufa según la reivindicación 1, en la que la entrada de aire secundario está conformada por una toma de aire trasera conectada al extremo de salida de la cámara de combustión. 10. Estufa según la reivindicación 1, en la que el dosificador es una compuerta de cierre que obstruye una boca de salida de combustible del depósit, y que es regulada por medios mecánicos accionados manualmente desde el exterior de la estufa.
WO2014093336	ZILKHA BIOMASS POWER I LLC (US)	**Combustor assembly and methods of using same.** One embodiment of the present disclosure relates to a combustor assembly which has a burner assembly and a combustor. The burner assembly has a body having a first end and a second end and a center passageway. The center passageway extends between the first end and the second end of the body. The body of the burner assembly is provided with a biomass inlet for receiving biomass, a primary air inlet for receiving air, a gas inlet for receiving gas, and a secondary air inlet for receiving air. The biomass inlet is in communication with the center passageway. Use: Burner assembly connected to combustor assembly (claimed) used in power system having feeding system for feeding biomass such as sawdust, bark, twig, branches, and other waste wood, bagasse, com cob, rice hull, orchard and vine trimming, and gas-fired turbine.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
EP2741000 (	KOFEN FORS-CHUNGS UND EN-TWICKLUNGSGES M B H (AT)	**Heating boiler with a heat engine.** The boiler has a combustion chamber for combustion of solid fuel i.e. biomass. A flame tube includes an inflow region facing the combustion chamber, and an outflow region facing a flue gas duct for discharging flue gases. A heat engine i.e. Stirling engine for converting heat energy into mechanical energy is coupled to a heat exchanger. The heat exchanger is provided in the outflow region of the flame tube, where the heat exchanger includes a leading face formed by a tapering in the direction of a tapered section of the heat exchanger. Use: Heating device i.e. heating boiler (claimed) for heating water.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014144281	PINOVA INC (US), et al	**Asphalt emulsifiers derived from pyrolyzed wood.** Asphalt emulsifiers and asphalt, emulsions comprised of alkali metal or ammonium salts of a biomass pyrolysis oil, such as a pyrolytic wood far oil, where the biomass pyrolysis oil Is used as made from -a pyrolysis process with only water washing, are disclosed.
WO2014145223	BATTELLE MEMO-RIAL INSTITUTE (US)	**Vapor phase catalytic reactor for upgrade of fuels produced by fast pyrolysis of biomass.** Vapor phase catalytic reactors and methods for using the same for upgrade of fuels produced by fast pyrolysis of biomass are disclosed. Use: As biofuel production system for catalytic pyrolysis of biomass
WO2014145198		**Pyrolysis or gasification loop using an auger.** Systems and apparatuses are provided for pyrolyzing and gasifying a biomass material.
WO2014145651	ALL POWER LABS INC (US)	**Hybrid fixed-kinetic bed gasifier for fuel flexible gasification.** A gasification system including: a casing defining: a solid material inlet; a fixed bed drying zone proximal the solid material inlet; a fixed bed pyrolysis zone arranged below the drying zone along a gravity vector, distal the solid material inlet across the pyrolysis zone; a kinetic bed combustion zone surrounded by the pyrolysis zone; and a fluidization channel extending through the drying zone and pyrolysis zone and fluidly connected to the combustion zone, the fluidization channel defining a kinetic bed reduction zone fluidly isolated from and thermally connected to the pyrolysis zone and the drying zone by the fluidization channel.
WO2014145731	GAS TECHNOLOGY INST (US)	**Rapid production of hydrothermally carbonized biomass via reactive twin-screw extrusion.** A system for the production of carbonized biomass that includes an infeed for accepting biomass feed material and an associated twin screw extruder. A water heater is connected with respect to at least one inlet along a length of the twin screw extruder and a pressure sustaining valve is connected at an outlet of the twin screw extruder.
WO2014143167	KOENIG MARK E (US), et al	**Method for processing material for a gasifier.** A method for providing material to a gasifier. The method comprises providing a feedstock. A flow of the feedstock is formed. The flow is then delivered to a gasifier such that it provides a substantially airtight seal to the gasifier. Use: Method for providing a feedstock material e.g. solid waste material (claimed) such as municipal solid waste (MSW), to gasifier i.e. plasma furnace. Can also be used for providing organic materials, fossil-based carbonaceous materials e.g. coal and petroleum coke, biomass materials and waste-derived feedstocks e.g. wood, plastic, aluminum, refuse-derived fuel (RDF), agricultural and industrial wastes, sewage sludge, switch grass, various crop residues and black liquor, to counter-current fixed bed, co-current fixed bed, fluidized bed, entrained flow bed and free radical bed.

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014143377	KIOR INC (US)	**Two stage process for producing renewable biofuels.** A process for treating bio-oil or pyrolysis oil used to produce renewable biofuel. In a first stage, solids and/or organic reactive molecules within the feedstream are reduced without substantially deoxygenating the organic reactive molecules in the feedstream. The resulting feedstream is then introduced into a second hydrotreatment stage to produce deoxygenated bio-oil or pyrolysis oil.
WO2014145448	ENGINUITY WORLDWIDE LLC (US)	**Rotary friction dryer and method of use.** A rotary friction dryer or gasifier and a method of using the same is provided. The rotary friction dryer (l)generally comprises an entrance stage, an exit stage, a decompression zone located such that it separates the entrance and exit stages, a multistage compression screw, a mixing means coupled to the screw, at least one exhaust vent located in the decompression zone, and at least one discharge outlet located in the exit stage. The entrance stage includes an intake throat and the temperature of each stage (entrance and exit) is controllable.
WO2014145689	ALL POWER LABS INC (US)	**Simultaneous pyrolysis and communition for fuel flexible gasification and pyrolysis.** A biomass thermal conversion system including a fixed bed drying zone; a fixed bed pyrolysis zone fluidly connected to the drying zone; a combustion zone fluidly connected to the pyrolysis zone by a material path; and a comminution mechanism arranged across the material path between the pyrolysis zone and the combustion zone, configured to grind char off a pyrolyzed surface of solid biomass and reduce a dimension of the solid biomass below a threshold size.
EP2774971	UPM KYMMENE CORP (FI)	**Process for the upgrading of gaseous products obtained from thermal processing of biomass.** The present invention relates to a process for converting gaseous products, said process comprising the steps, where a feedstock comprising gaseous products obtained from thermal processing of biomass is subjected to oxidation in the presence of an oxidant, under conditions suitable for enacting said oxidation to yield an oxidation product, and subjecting the oxidation product to condensation in the presence of a basic catalyst to obtain bio-oil. The invention also relates to the use of bio-oil, obtainable by said process, as heating oil, as starting material in processes for producing fuels, fuel components, fine chemicals, chemical building-blocks, and solvents.
WO2014133700	FORCE JASON (US)	**Mobile platform based biomass powered harvester.** A mobile platform based biomass powered harvester has a header, a biomass processor, a heated storage container, a guidance system, a biomass gasification reactor, a syngas engine, an electric generator, and a guidance system. The header harvests biomass. The biomass processor includes a shredder, a press, a dryer, and a densifier. The densifier compacts the biomass into a multitude of compressed biomass pieces. The heated storage container receives compressed biomass pieces from the biomass processor. The guidance system guides the mobile platform at a speed determined by the operating capacity of the densifier. The biomass gasification reactor generates syngas from compressed biomass pieces. The syngas engine generates shaft power. The electrical generator converts the shaft power to electricity to power the guidance system.
WO2014129910	ARBAFLAME TECHNOLOGY AS (NO)	**Method and apparatus for preparing fuel from biomass.** Method and apparatus for preparation of fuel from biomass wherein the biomass is subjected to a heat treatment in a temperature range from 150 to 300 C, in a reactor pressurized with steam and air, wherein the pressure at completed treatment is released. The volume increase of steam and other gases from the pressure release is temporarily accumulated in a container of a flexible volume while steam and other gases are subjected to heat exchange in at least one heat exchanger so that condensable gases are condensed and release their heat of condensation in the at least one heat exchanger.

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014128467	CHINOOK END STAGE RECYCLING LTD (GB)	**Improvements in waste processing.** This invention provides an apparatus for pyrolysing or gasifying material containing an organic content. The apparatus comprising an oven mounted for rotation on at least one support. The oven has an inlet for receiving hot gas having a low or zero oxygen content to heat the material therein so as to process it to produce syngas, and an outlet for said syngas. An electromagnet is disposed in or adjacent the oven so as to create a magnetic field therein and a plurality of ferrous elements are freely disposed within the oven. A controller is provided for controlling the electromagnet and the rotation of the oven. When activated the electromagnet retains said ferrous elements as the oven rotates.
WO2014131398	BINZER FRANZ (DE)	**Device and method for thermal utilisation of residual material.** The invention relates to a device and a method for thermal utilisation of residual material, wherein the device comprises: a reactor chamber for accommodating starting materials; a heating device for heating the reactor chamber, wherein the starting materials accommodated in the reactor chamber are decomposed during the heating and gaseous products are thereby produced; a gas discharge line for discharging the gaseous products from the reactor chamber; a temperature sensor for detecting the temperature present at a position of the gas discharge line as a gas discharge temperature; a temperature sensor for detecting the temperature present in the reactor chamber as a reactor temperature; and a control device, which is designed in such a way that the control device performs a comparison of the gas discharge temperature with the reactor temperature and outputs a signal depending on the result of the comparison.
WO2014130537	CHEVRON USA INC (US)	**In-situ upgrading of biomass pyrolysis vapor.** Processes for thermal conversion of biomass are provided. The processes involve upgrading the pyrolysis vapor from a pyrolysis reactor. The steps include thermally converting a biomass feedstock in a pyrolysis reactor, recovering a pyrolysis vapor from the reactor, passing the pyrolysis vapor in contact with (i) a water-gas shift reaction catalyst and a hydrotreating catalyst, optionally also passing the pyrolysis vapor in contact with a cracking catalyst or a cracking catalyst and an acid catalyst, or (ii) an acid catalyst in the presence of an alcohol, and converting the resulting upgraded pyrolysis vapor into a liquid product. The resulting biooil liquid product is more refined, and the overall processes offer economic and energy efficiency.
WO2014121368	ENVIROLLEA INC (CA)	**Thermal process to transform contaminated or uncontaminated feed materials into useful oily products, uses of the process, products thereby obtained and uses thereof, manufacturing of the corresponding plant.** The process is for thermally treating a feed material. The process comprises at least one step performed in a rotating kiln operating under positive pressure with a pressure control system and wherein in the process a sweep gas, that is an inert gas or a substantially non-reactive gas, is injected into the rotating kiln or in the feed stream entering the rotating operating kiln; or at least one step performed in a rotating kiln operating under positive pressure managing system; or at least one step performed in a rotating kiln wherein a sweep gas is injected in the rotating kiln or in the feed stream entering the rotating operating kiln. In step a), or in b) or in step c), the conditions of the thermal treatment are managed in order that the exit stream, after cooling, result in at least one liquid phase that is preferably essentially an oily liquid phase.
EP2765176	KIOR INC (US)	**Organics recovery from the aqueous phase of biomass catalytic pyrolysis.** A method for recovering a water-soluble complex mixture of organic compounds from an aqueous stream comprising: a) passing said aqueous stream comprising a water-soluble complex mixture of organic compounds to a removal zone A for contact with a sorbent A comprising a polymeric microreticular sorbent resin for removal of at least a portion of the water-soluble complex mixture of organic compounds from said aqueous stream forming a removed quantity A comprising water-soluble organic compounds; b) passing said aqueous stream from said removal zone A to a removal zone B for contact with a sorbent B for removal of at least a portion of the water-soluble complex mixture of organic compounds from said aqueous stream forming a removed quantity B comprising water-soluble organic compounds;; and c) recovering at least a portion of said removed quantity A from said removal zone A forming recovered quantity A and recovering at least a portion of said removed quantity B from said removal zone B forming recovered quantity B.

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014126895	SOLENA FUELS CORP (US)	**One stage atmospheric pressure thermo-catalytic plasma gasification and vitrification of organic material such as biomass for the production of renewable energy.** An apparatus for one stage thermo-catalytic plasma gasification and vitrification of organic material comprising: a generally funnel-shaped reactor having an upper section and a lower section, the lower section comprising a first, wider portion connected by a frustoconical transition to a second, narrower portion, and being suitable to receive a catalyst bed, and the upper section having at least one gas exhaust port; a plurality of inlets for the material from a plurality of directions located at the upper part of the lower section for introducing material into the upper portion of the lower section; a gas inlet system disposed around the lower section to provide gas into the lower section through one or more intake ports in the lower section; and a plurality of plasma arc torches mounted in the lower section to heat the catalyst bed and material, along with a method for plasma treatment of biomass.
WO2014116724	ANELLOTECH INC (US)	**Gas jet injector reactor for catalytic fast pyrolysis. Methods and systems utilizing gas jets to carry biomass into a biomass conversion reactor are described.** Reactor configurations and conditions for carrying out processes utilizing the gas jets are also described. The use of gas jets has been found to be especially desirable for operation with pyrolysis of biomass in catalytic fluidized bed reactors. A feed system for introducing biomass into a pyrolysis reactor, such as a catalytic fast pyrolysis (CFP) fluid bed reactor, that employs a jet stream of gas or vapor to inject the biomass particles into the fluid bed is disclosed. The biomass is kept relatively cool, can be metered upstream of a gas jet, and can be injected far into the fluid bed. Good mixing between the relatively cooler biomass with the hot catalyst and other materials in the fluid bed can be insured by adjustment of the number, size, angle, position, and flow rate of the multiple injector ports in larger reactors.
EP2752478	FRITSCHE ANDREAS (AT)	**Carburettor device.** The device has a reactor cavity that surrounds a reactor vessel. A filler sheath is arranged for feeding biomass i.e. wood such as hogged wood, to the reactor cavity. A gas outlet is arranged for discharging gas produced from the combustible biomass from the reactor cavity. A feed device comprises a set of outlet openings for outputting a gasifying agent into the reactor cavity. The set of outlet openings of the feed device is movable in a transverse direction i.e. preferably orthogonal, to a transport direction.
WO2014104969	EUROTURBINE AB (SE)	**Method and plant for transferring energy from biomass raw material to at least one energy user.** A method for producing energy including: producing fuel gases from biomass raw material in a main receptacle unit, feeding produced fuel gas to a consumer unit, transferring energy from the consumer unit to at least one energy user. The method includes recovering heat and producing pressurized superheated steam, intermittently loading biomass raw material into at least one vessel , being included in the main receptacle unit, pressurizing the loaded at least one vessel with pressurized superheated steam, passing pressurized superheated steam through the loaded and pressurized at least one vessel, thereby contacting and heat treating said biomass raw material with the pressurized superheated steam for the production of said fuel gases, supplying produced fuel gases together with still superheated steam to the consumer unit. The invention also concerns a plant.
EP2749626	ENI SPA (IT)	**Integrated process for the production of biofuels from solid urban waste.** Integrated process for the production of biofuels from solid urban waste which comprises: - subjecting said waste to liquefaction obtaining a mixture comprising an oily phase consisting of bio-oil, a solid phase and an aqueous phase; - subjecting the mixture obtained from said liquefaction to separation obtaining an oily phase consisting of bio-oil, a solid phase and an aqueous phase; - subjecting the oily phase consisting of bio-oil, obtained from said separation to hydroconversion in slurry phase, in the presence of at least one nano-dispersed hydrogenation catalyst; wherein said liquefaction is carried out at a temperature ranging from 150 DEG C to 350 DEG C, preferably ranging from 200 DEG C to 320 DEG C, at a pressure ranging from 5 bar to 170 bar, preferably ranging from 15 to 115 bar and for a time ranging from 5 minutes to 240 minutes, preferably ranging from 15 to 90 minutes. The biofuels thus obtained can be used as such, or in a mixture with other fuels, for automotive.

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014097236	MARASA SALVATORE (IT)	**Pyro-gasification reactor.** A pyro-gasification reactor of the downdraft type, which is adapted to be applied to a pyro-gasification plant. The reactor comprises: - at least one first inlet, through which a predetermined amount of biomass is introduced; - a storage tank, into which the biomass to be pyrolyzed and gasified is introduced; at least one second inlet, through which a fluidizing agent is introduced into the reactor by means of a fluidizing agent introducing plant (A); - a core, in which the pyrolysis and gasification processes take place and which is arranged under said storage tank. Said core comprises at least one first reaction chamber and at least one first grate, which is adapted to support the biomass during the pyro-gasification process. The reactor comprises a cooling structure, which is adapted to surround the core, thus enclosing it, creating a hollow space. The cooling structure is fluidly connected to said fluidizing agent introducing plant (A), so as to allow a fluid to flow through said hollow space. The second inlet to introduce the fluidizing agent is arranged in correspondence to said core, thus allowing the fluidizing agent contained in said hollow space to be at least introduced into said first reaction chamber. Use: A downdraft-type pyro-gasification reactor for producing synthesis gases from biomas

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DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014142762	UNIV NANYANG TECH (SG)	**Combined ultrasonication and enzymatic pretreatment of waste activated sludge prior to anaerobic digestion.** There is herein disclosed a method of pretreating organic waste comprising the steps of (a) providing an organic waste; (b) subjecting the organic waste to ultrasonication; and (c) subjecting the ultrasonicated organic waste to a heat treatment step at a temperature of from 35 DEG C to 85 DEG C. There is also disclosed a waste treatment plant comprising a pre-treatment apparatus that comprises an ultrasonicator apparatus and a heating apparatus adapted to act in a batch or continuous fashion on an organic waste, wherein the ultrasonicator apparatus is placed upstream of the heating apparatus and is in fluid communication therewith.
EP2777798	EISENMANN AG (DE)	**Method for the recovery of high purity methane from biogas and plant for carrying out this method.** The process comprises: compressing a biogas from a fermenter; dividing the compressed biogas into two streams by a selective gas permeable membrane, where one of the streams contains higher proportion of methane, and the other stream comprises reduced proportion of methane; generating a pressure difference across the membrane; supplying a sufficient proportion of methane-containing gas stream as a product gas; continuously measuring the methane gas content in the product gas; and increasing the pressure difference across the membrane if the methane content falls below a predetermined value. The process comprises: compressing a biogas from a fermenter; dividing the compressed biogas into two streams by a selective gas permeable membrane, where one of the streams contains a higher proportion of methane, and the other stream comprises a reduced proportion of methane; generating a pressure difference across the membrane; supplying a sufficient proportion of methane-containing gas stream as a product gas for further use; continuously measuring the methane gas content in the product gas; and increasing the pressure difference across the membrane if the methane content in the product gas falls below a predetermined value, such that a vacuum is created or an existing vacuum is increased on a low pressure side of the membrane. An independent claim is included for a plant for recovering high-purity methane from biogas.

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2014137218	CAMBI TECHNOLOGY AS (NO)	**Method and device for thermal biological breakdown and dewatering of biomass.** A method is described for thermal biological breakdown and dewatering of biomass, which is characterised in that it comprises the following steps: - lead the biological residue material from a digesting tank to a dewatering device and dewater the material to typically 15-25% dry matter, - lead the dewatered material to a device and carry out a thermal hydrolysis at typically 145-170 DEG C for typically 10-40 minutes, - subject the hydrolysed biomass to a quick pressure reduction that results in a steam explosion in the biomass, - dewater the thermally hydrolysed and steam exploded hot biomass, at typically 85-105 DEG C in a closed dewatering unit, typically a centrifuge, to typically 35-60% dry matter, - cool the dewatered biomass in a cooler, preferably an air- cooler and dewater the biomass further by evaporation to typically 40- 75% dry matter, - lead the liquid phase from the dewatering unit, which contains considerable amounts of hydrolysed organic matter and heat upstream of the digesting tank for increased production of biogas. Also described is a device to carry out the method.
WO2014128300	KRAJETE GMBH (AT)	**Method and system for producing methane using methanogenic microorganisms and applying specific nitrogen concentrations in the liquid phase.** The present invention provides a method and system for producing methane. The method comprises contacting methanogenic microorganisms in a reaction vessel with hydrogen and carbon dioxide, wherein the nitrogen concentration in the liquid phase inside the reaction vessel is in the range of 0.0001 to 35 mmol/L or in the range of 5 to 1000 mmol/L. The invention further provides a system for the method for producing methane comprising at least one bioreactor comprising a reaction vessel suitable for growing, fermenting and/or culturing methanogenic microorganisms, at least one device for providing a gas feed of hydrogen and carbon dioxide into the reaction vessel, and at least one device for measuring the nitrogen concentration in the liquid phase inside the reaction vessel. Further provided us the use of a cell culture comprising methanogenic microorganisms and having a nitrogen concentration in the liquid phase of the cell culture in the range of 0.0001 to 35 mmol/L or in the range of 55 to 1000 mmol/L for producing methane.
EP2769764	WEBER ENTEC GMBH & CO KG (DE)	**Continuous flow ultrasound reactor, ultrasound processing device and method for the treatment of substrates.** Flow-through ultrasonic reactor for disintegration of flowable substrates, preferably biogenic sludges, preferably for increasing the yield during the production of biogas, or for treatment of preliminary, intermediate or finished products during the production of biodiesel or bioethanol, comprises at least one pipe section for the passage of the substrate and for integration in a pipe system for the substrate. At least one ultrasonic oscillator is arranged outside the pipe section. The ultrasonic oscillator is designed for radiating ultrasonic energy into the substrate. Flow-through ultrasonic reactor for disintegration of flowable substrates, preferably biogenic sludges, preferably for increasing the yield during the production of biogas, or for treatment of preliminary, intermediate or finished products during the production of biodiesel or bioethanol, comprises at least one pipe section for the passage of the substrate and for integration in a pipe system for the substrate. At least one ultrasonic oscillato is arranged outside the pipe section. The ultrasonic oscillator is designed for radiating ultrasonic energy into the substrate through a wall of the pipe section during operation of the ultrasonic reactor for at least partially disintegrating the substrate or treating the substrate using ultrasound. Independent claims are also included for: an ultrasonic treatment system for disintegration of flowable substrates, preferably biogenic sludges, preferably for increasing the yield during the production of biogas, or for treatment of preliminary, intermediate or finished products during the production of biodiesel or bioethanol, comprising at least one flow ultrasonic reactor and at least one ultrasonic generator for operating at least one ultrasonic oscillator, where the pipe section of the flow-through ultrasound reactor is integrated in the pipe system for the substrate; and disintegrating flowable substrates, preferably biogenic sludges, preferably for increasing the yield during the production of biogas, or for treatment of preliminary, intermediate or finished products during the production of biodiesel or bioethanol, comprising conveying the substrate through at least one pipe section of the ultrasonic reactor, where the substrate is applied with the ultrasonic energy through the wall of the pipe section using at least one ultrasonic oscillator during operation of the ultrasonic reactor for at least partially disintegrating the substrate or treating the substrate by means of ultrasound.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
EP2767585	POLITECHNIKA LÓDZKA (PL)	**Microbiological method of H2S removal from biogas.** The present invention is based on a method of purification of a microbiological biogas arising from the methane fermentation of settled organic matter in a fermentation container, based on the removal of contaminants, particularly H 2 S, under anoxic conditions, in an installation containing a biofilter loaded with a biological filter bed sprinkled with a mineral medium, containing immobilised microorganisms capable of degrading sulphur compounds, characterised in that the biological filter bed is sprinkled with a medium in the form of a solution containing nitrogenous salts of alkali metals of the I and II group, wherein the concentration of nitrogen ions in the medium is contained in the range of 20 to 2500 mg/l, preferably in the range of 50 to 1000 mg/L, whereas the concentration of H 2 S loaded into the installation is 100 - 3000 ppm.
WO2014124500	CRC CARE PTY LTD (AU)	**A system for processing organic waste.** A method and system for processing organic waste including: an anaerobic bioreactor for fermenting the organic waste to generate biogas, the anaerobic bioreactor including: an inlet for receiving said organic waste in the anaerobic bioreactor; an outlet for outputting said organic waste from the anaerobic bioreactor; a fermentation tank disposed between the inlet and the outlet for fermenting the organic waste passing therethrough to generate the biogas; and a biogas outlet for outputting the biogas generated in the fermentation tank; and an aerobic bioreactor covering at least in part the anaerobic bioreactor and containing a further organic waste, whereby the further organic waste in the aerobic bioreactor decomposes and thermally regulates the anaerobic bioreactor.
WO2014125133	DE ANDRÉS GARCÍA PABLO (ES)	**Unit and method for improving the biodegradability of sources of organic material.** The invention relates to a unit comprising multiple elements, essentially characterised by the use of high-power cavitation/friction mixers which are used together with dispersants and oxidants in multiple steps in series, as well as including an increase in the prior temperature in a continuous process. The device is based on the heating of organic material and dividing same into fine particles by means of cavitation-dispersion and on the chemical oxidation of the cell membranes and walls, all in order to promote conditions for biodegradability. The final operation is the result of the joint action of multiple systems that combine physicochemical dispersion forces, chemical oxidants and temperature. This combination multiplies the effect and minimises reagent and power costs. The unit comprises two heating modules, measurement and control means, a cavitation-dispersion reactor, a membrane-rupture cavitation reactor, and a sterilisation reactor, as well as a controlled acidification reactor. The invention can be used to improve the biodegradability of material and, consequently, the final energy yield.
WO2014122331	ALGAENERGY S A (ES), et al	**Method for the valorisation of photosynthetic microorganisms for integral use of biomass.** The invention relates to a method comprising the steps of: introducing a biomass of photosynthetic microorganisms into a stirred tank using cellulolytic enzymes in order to liquefy the sugars; separating the resulting mixture using a filtration and/or centrifugation process; producing bioethanol by means of the saccharification of the carbohydrates, followed by fermentation with yeast; producing concentrates of peptides and amino acids using proteolytic enzymes in an enzymatic hydrolysis process, in which the resulting reaction mixture must be separated using a filtration and/or centrifugation process; producing biodiesel by means of the transesterification of the fatty acids present in the biomass with sulphuric acids and methanol; and producing biogas using an anaerobic digestion process.
WO2014117779	XERGI NIX TECHNOLOGY AS (DK)	**A biomass pre-treatment system and a method thereof.** According to an embodiment of the invention, a biomass pre-treatment system is disclosed. The system includes a chamber defined by a chamber wall, a substantially cylindrical compartment at a bottom section of the chamber, wherein the substantially cylindrical compartment includes a stirring unit. The stirring unit includes a rotatable shaft having stirring elements extending therefrom, the stirring elements being adapted to mix a biomass material received in the chamber and to propel the received biomass material along a length of the chamber in a pre-determined direction.

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2014114378	ZUFIAUR FERNANDEZ DE BETO O ALFRED (ES)	**Multi-compartment device for the treatment of vertical flow wastewater.** It is characterized in that it comprises a deposit divided into a plurality of compartments (2, 2', 2'',...,2n) that communicate to one another and configured to operate as autonomous reactors. The circulation of wastewater occurs from one compartment to the next in a successive manner, where the compartments(2, 2', 2'',...,2n) are hermetically closed in their upper part and have hoods for the collection of gases from the metabolic reactions, a receptacle for the collection of sediments in their lower part, and a mesh filter for the separation of biomass in their central portion.
WO2014114557	AXPO KOMPOGAS ENGINEERING AG (CH)	**Fermenter supply method, biogas plant, and conversion method.** The intention is to modify a fermenter supply method for a biogas plant in such a manner that the total throughput of the substrate through a plurality of fermenter chambers in the biogas plant is increased, wherein the number of fermenter chambers is not changed. This is achieved by supplying an inoculum fermenter chamber with raw fermentation substrate of an amount (Mi) per unit of time and fermenting for a dwell time (ti), returning part of the substrate fermented in the inoculum fermenter chamber in the form a self-inoculating substrate to the inoculum fermenter chamber by means of a return path, said part being mixed with the raw fermentation substrate, and supplying a fast fermenter chamber coupled to the inoculum fermenter chamber with an additional part of the substrate fermented in the inoculum fermenter chamber; in the form of a fast fermenter inoculating substrate and mixing said additional part with fast fermenter raw substrate of an amount (MR) per unit of time, wherein fermented output substrate is removed from the fast fermenter chamber after a dwell time (ts) of the substrate mixture introduced into the fast fermenter chamber.
WO2014116186	UNIV NANYANG TECH (SG)	**A process for mitigating sulfate impact on and enhancing methane production in anaerobic systems.** Disclosed herein is an anaerobic two-phase process for the treatment of organic waste comprising the steps of: introducing a feed stream comprising organic waste into a first phase reactor; generating an effluent from the first phase reactor; and providing the effluent from the first phase reactor to a second phase reactor, wherein, during at least the start-up period of the process, the first phase reactor has a sludge retention time (SRT) of from 10 days to 25 days and the pH is maintained at a pH of from 4.5 to 6.0. Such a "pretreatment" reactor which decreases sulfate and sulfide concentration fed to the methanogenic reactor reduces the adverse impact of sulfate on methane production in the downstream methanogenic reactor.
WO2014111734	PURSUIT MARINE DRIVE LTD (GB)	**Waste processing apparatus and biogas production.** A method of processing biodegradable waste is provided. The method comprises providing at least one waste processing device, the or each device having a processing passage with a passage inlet and a passage outlet, and a nozzle circumscribing the passage and opening into the passage between the passage inlet and passage outlet. The method further comprises directing a flow of a biodegradable waste slurry into the processing passage, and supplying a processing fluid to the nozzle and injecting the processing fluid through the nozzle into the waste slurry within the processing passage. The processing fluid is supplied to the or each device at a temperature and pressure which results in the waste slurry leaving the passage outlet with an exit temperature of 45-160 DEG C. A method of producing biogas from biodegradable waste is also provided, as is a waste processing apparatus.
EP2749636	UNIV RIGAS TEHNISKA (LV)	**Method of using alkali-activated non-cement binders for producing biogas from cheese whey.** The invention relates to method for producing biogas from cheese whey using alkali-activated-non-cement binders. The use of a cement free alkali activated binder comprising alumo-silicate source materials, lead-silicate glass, calcinated metakaolin clay, and alcaline inorganic materials comprising sodium materials as pH stabilizer and/or material for cell immobilization for producing biogas from cheese whey is suggested. The invention allows to considerably increase the rate of biogas production from fermentation medium containing cheese whey as well as to utilize waste from aluminium scrap recycling industry, calcined metakaolin and glass waste.

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WO2014108624	ENGEL RÉMY MARIE ARNAUD (FR), et al	**Device for the separate recovery of biogas and rainwater for a structure for storing loaded liquid effluents such as liquid manure.** A device for the separate recovery of biogas and rainwater for a structure for storing loaded liquid effluents such as liquid manure. This device comprises a first substantially horizontal membrane covering substantially all of the surface of the loaded liquid effluent, and a second substantially vertical membrane disposed all around the first membrane and consisting of a lower portion and an upper portion disposed to either side of said first membrane, and means for discharging biogas and rainwater. This device is intended, in particular, for farms that produce effluents and have uncovered storage structures
WO2014105847	PIONEER HI BRED INT (US), et al	**Compositions and methods comprising a combination silage inoculant.** Compositions and methods for the production of biogas from forage are provided. Compositions comprise a combination microbial inoculant, silage produced from forage inoculated with the combination microbial inoculant, and biogas produced from the silage. Various methods are provided for increasing biogas production and decreasing dry matter loss by inoculating forage with a combination inoculant. In certain embodiments, inoculating forage with specific combinations of bacterial strains results in a synergistic decrease in dry matter loss and a synergistic increase in biogas production. In other embodiments, inoculating a biomass composition comprising silage and sludge with specific combinations of bacterial strains results in a synergistic increase in biogas production.
WO2014101915	REICHHART THOMAS (DE)	**Method and device for producing regenerative energy from biomass.** The invention relates to a method for producing regenerative energy by fermentation of biomass in at least one fermenter, wherein the biomass is subjected to a pretreatment before being fed to the fermenter, the method comprising the following steps: - feeding the biomass to a closed reactor; - pretreating the biomass under the action of heat and pressure in at least one sub-process of the hydrothermal carbonization in the reactor; - feeding the pretreated biomass to the fermenter; and - fermentation of the pretreated biomass for the production of biogas.
WO2014095669	VERBIO VEREINIGTE BIOENERGIE AG (DE)	**Method and plant for producing biogas from lignocellulose-containing biomass.** The invention relates to a method for producing biogas from lignocellulose-containing biomass, preferably from straw, and to a plant for carrying out said method.
ES2464240	LOPEZ DIAZ JUAN MANUEL (ES)	**Procedimiento de agitado mediante la presión generada por la digestión anaerobia de fluidos orgánicos y biodigestor concebido para ello.** El biodigestor de la invención se caracteriza por estar constituido por dos cámaras de dimensión, forma y características estructurales idénticas; un conjunto de tuberías perforadas que comunican distintos niveles de ambas cámaras; un conjunto de láminas inclinadas con relieve en varios niveles y una instalación de drenado basada en el uso de un sistema hidrociclón.; El procedimiento se caracteriza porque se agita el fluido orgánico contenido en el biodigestor de la invención, alterando el contenido de biogás de las cámaras que lo constituyen mediante dos técnicas alternativas: a) La incorporación de fluido orgánico fresco a una de las cámaras con cierre de válvula de gas de conexión entre cámaras. b) La exportación del gas de fermentación producido en una de las cámaras con cierre de válvula de gas de conexión entre cámaras. La agitación se produce cuando aparece una diferencia suficiente de niveles entre las cámaras y se abre la válvula de presión que las conecta

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WO2014138672	NOVOZYMES AS (DK), et al	**Cellobiohydrolase variants and polynucleotides encoding same.** The present invention relates to cellobiohydrolase variants. The present invention also relates to polynucleotides encoding the variants; nucleic acid constructs, vectors, and host cells comprising the polynucleotides; and methods of using the variants. Use: As cellobiohydrolase variant for making transgenic plant; for degrading a cellulosic material; for fermenting a cellulosic material for producing fermentation product (claimed); to hydrolyze the cellulosic material to fermentable sugars, e.g. glucose, cellobiose, and pentose monomers; to saccharify the cellulosic material to fermentable sugars and to convert the fermentable sugars to many useful fermentation products, e.g. fuel (ethanol, n-butanol, isobutanol, biodiesel, jet fuel) and/or platform chemicals (e.g. acids, alcohols, ketones, gases, oils).
WO2014135755	IFP ENERGIES NOUVELLES (FR)	**Method for producing alcohols and/or solvents from lignocellulosic biomass with washing of the solid residue obtained after fermentation.** The invention relates to a method for producing alcohol and/or solvent from a biomass feedstock, comprising steps of pretreatment (P) of the biomass feedstock, enzymatic hydrolysis (H1 and HF) and fermentation of the hydrolysate (HF). In order to prevent solids from being conveyed and to facilitate the operation of the section for the purification of the fermentation products, at least one part of solid material contained in the fermentation wine is extracted (Ex1) so as to obtain a flow (11) of solid residue comprising lignin and a fermentation wine (12) depleted in solid material. Then, the flow of solid residue is washed (L) with a liquid flow so as to obtain a liquid flow enriched in fermentation products (16). The liquid flow enriched in fermentation products (16) is recycled in the enzymatic hydrolysis step (H1) in order to collect all fermentation products and increase the overall yield of the method.
WO2014132426	JGC CORP (JP)	**Method for pretreating biomass, and method for producing sugar containing glucose as main component.** A method for pretreating a biomass, comprising: a first treatment for improving the contact efficiency between cellulose and/or hemicellulose and a cellulose- and/or hemicellulose-degrading enzyme in the biomass; and a second treatment for placing the biomass that has been subjected to the first treatment in a container having a ventilation hole that is communicated with the outside of the container and then heating the biomass that has been subjected to the first treatment with water at a temperature that is equal to or lower than the boiling temperature of water while continuously opening the ventilation hole, thereby removing a substance that contains at least an organic acid from the biomass that has been subjected to the first treatment.
WO2014130812	NOVOZYMES AS (DK), et al	**Methods of saccharifying and fermenting a cellulosic material.** The invention relates to methods of saccharifying a cellulosic material comprising subjecting the cellulosic material to a cellulolytic enzyme composition and a GH61 polypeptide, and optionally a catalase in the presence of dissolved oxygen at a concentration in the range of 0.5 to 10% of the saturation level. The invention also related to methods of producing desired fermentation products, such as ethanol, using a method including a saccharification step of the invention.
WO2014127345	UNIV RICE WILLIAM M (US)	**Solar steam processing of biofuel feedstock and solar distillation of biofuels.** A method of producing bioethanol that includes receiving a feedstock solution that includes polysaccharides in a vessel comprising a complex is described. The complex may be copper nanoparticles, copper oxide nanoparticles, nanoshells, nanorods, carbon moieties, encapsulated nanoshells, encapsulated nanoparticles, and/or branched nanostructures. The method also includes applying electromagnetic (EM) radiation to the complex such that the complex absorbs the EM radiation to generate heat. Using the heat generated by the complex, sugar molecules may be extracted from the polysaccharides in the feedstock solution, and fermented. Then, bioethanol may be extracted from the vessel.

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WO2014122331	ALGAENERGY S A (ES), et al	**Method for the valorisation of photosynthetic microorganisms for integral use of biomass.** The invention relates to a method comprising the steps of: introducing a biomass of photosynthetic microorganisms into a stirred tank using cellulolytic enzymes in order to liquefy the sugars; separating the resulting mixture using a filtration and/or centrifugation process; producing bioethanol by means of the saccharification of the carbohydrates, followed by fermentation with yeast; producing concentrates of peptides and amino acids using proteolytic enzymes in an enzymatic hydrolysis process, in which the resulting reaction mixture must be separated using a filtration and/or centrifugation process; producing biodiesel by means of the transesterification of the fatty acids present in the biomass with sulphuric acids and methanol; and producing biogas using an anaerobic digestion process.
WO2014100742	UNIV CALIFORNIA (US)	**Modulation of expression of acyltransferases to modify hydroxycinnamic acid content.** The invention provides methods of engineering plants to modulate hydroxycinnamic acid content. The invention additionally provides compositions and methods comprising such plants.
WO2014118757	INST RECH DEVELOPPEMENT IRD (FR)	**Solid state fermentation device and products obtained.** The invention concerns a solid state fermentation (SSF) device, characterised in that it comprises - a rigid outer mould - an inner portion forming a removable single-use fermentation chamber formed from a flexible material and comprising 2 portions, - the lower portion, or lower chamber, which is harder and has a shape almost identical to that of the container, - the upper portion or upper chamber intended to enclose the material that is to be fermented, formed from a more flexible material, the useful volume thereof being greater than that of the lower portion, - aeration means being provided between these two portions. Use: The solid state fermentation device is useful: for cultivating microorganisms such as bacteria, actinomycetes, yeasts and filamentous fungi on substrates or solid supports (natural or synthetic) impregnated with a nutrient solution and inoculum, preferably mycelia, spores of filamentous fungi and primary or secondary metabolites including enzymes, organic acids and mycotoxins used in industrial fields; in biopesticides and biorefineries for the conversion of biomass into bio-fuels; for the production of cellulosic ethanol from lignocellulosic biomass, etc biomass (all claimed).
WO2014110675	UNIV CONCORDIA (CA)	**Novel cell wall deconstruction enzymes of amorphotheca resinae, rhizomucor pusillus, and calcarisporiella thermophila, and uses thereof.** The present invention relates to novel polypeptides and enzymes (e.g., thermostable proteins and enzymes) having activities relating to biomass processing and/or degradation (e.g., cell wall deconstruction), as well as polynucleotides, vectors, cells, compositions and tools relating to same, or functional variants thereof. More particularly, the present invention relates to secreted enzymes that may be isolated from the fungi, Amorphotheca resinae strain DAOM194228, Rhizomucor pusillus strain CBS 183.67, and Calcarisporiella thermophila strain CBS 279.70. Uses thereof in various industrial processes such as in biofuels, food preparation, animal feed, pulp and paper, textiles, detergents, waste treatment and others are also disclosed.
WO2014108653	INST NAT DE RECH EN SCIENCES ET TECHNOLOGIES POUR L ENVIRONNEMENT ET L AGRICULTURE IRSTEA (FR)	**Method for producing ethanol from organic waste, and facility for implementing said method.** A method for producing ethanol from organic waste containing, as a result of fermentation, fermentable materials and lignocellulosic materials in a reactor in anaerobic conditions and a relative humidity greater than 60%, stopped when the liquid fraction reaches a pH of 4.5, followed by recovery of the liquid and/or gaseous fraction produced, containing ethanol, and separation/concentration of the ethanol, characterised in that the energy needed to regulate the temperature and/or the concentration/separation of the ethanol is provided by processing the solid fraction of the fermented waste in a digester. A facility for implementing the method which sends the gas from the fermenter to the digester.

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WO2014116517	US AGRICULTURE (US)	**Novel kluyveromyces marxianus strains and method of using strains.** Described are novel Kluyveromyces marxianus strains NRRL Y-50798 and Y-50799, that were obtained by UV-C irradiation of wild-type K. marxianus NRRL Y-1109 cultures. The UV-C-mutagenized strains were incubated under anaerobic conditions on xylose or glucose medium for a period of 5 months at 46 DEG C before being selected. These mutagenized strains have potential application in large-scale industrial conversion of lignocellulosic sugars to fuel ethanol given their ability to ferment at temperatures at 46 DEG C and above.
WO2014108454	DSM IP ASSETS BV (NL)	**Process for enzymatic hydrolysis of lignocellulosic material.** The invention relates to a process for the hydrolysis of cellulose containing biomass which comprises - a liquefaction step in which a first enzyme or first enzyme composition is added to liquefy at least part of the solids present in the biomass and to keep the viscosity of the cellulose containing biomass below 1000 cP, preferably below 800 cP, more preferably below 600 cP in the liquefaction step; followed by - a saccharification step in which a second enzyme composition is added to form oligomeric and/or monomeric sugars; and - whereby the first enzyme or first enzyme composition is different from the second enzyme composition; - whereby the first enzyme or first enzyme composition comprises an endoglucanase; . whereby the second enzyme composition comprises a cellulase; and - whereby the first enzyme or first enzyme composition comprises more endogluconase than the second enzyme composition (expressed in protein wt%).
WO2014107515	UNIV SOUTHERN ILLINOIS (US)	**Methods for improved ethanol production.** Some embodiments provide a process for the production of ethanol. The process includes performing liquefaction, saccharification, and fermentation steps to produce ethanol from an organic material. In one embodiment, the liquefaction step may include disposing a carbon-containing material within a first vessel, adding at least one enzyme to the first vessel, and incubating the first vessel at a first temperature for a predetermined time period. Next, the saccharification step can include adding at least one enzyme to the first vessel and then incubating the first vessel at a second temperature to form a liquefact in the first vessel. Then, in some embodiments, the fermentation step includes removing the liquefact from the first vessel and transferring the liquefact to a second vessel. Once in the second vessel, at least one additional enzyme, at least one nutrient, and a plurality of yeast cells can be added to the second vessel. Then, the second vessel is incubated to promote fermentation.
WO2014103148	KAWASAKI HEAVY IND LTD (JP)	**Saccharification reaction device.** A saccharification reaction device comprising a reaction vessel that causes a raw material to have a saccharification reaction, and a raw material insertion device that inserts the raw material into the reaction vessel at prescribed intervals. The reaction vessel has: a heating-vapor supply unit that heats the raw material inserted from the raw material insertion device, up to a saccharification reaction temperature; and a feeding mechanism that sequentially feeds the inserted raw material to a discharge port in a prescribed short time period, while causing a saccharification reaction at high temperature and under high pressure. The raw material insertion device is configured so as to insert the raw material into the reaction vessel at a bulk density appropriate for the saccharification reaction speed of the reaction vessel. As a result, a saccharification reaction device is provided that is capable of inserting the raw material into the reaction vessel in a state appropriate for saccharification and decomposition, by using the raw material insertion device, and capable of efficiently saccarifying and decomposing the raw material, by using the reaction vessel. Use: Saccharification reaction device for use in bioethanol manufacturing equipment used for manufacturing bioethanol using biomass feedstock such as bagasse and rice straw.

TECNOLOGÍAS QUÍMICAS
Patentes

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WO2014138992	TRENT UNIVERSITY (CA)	**Certain dimers as crystallization depressants.** This application relates to certain dimers as crystallization depressants for biodiesel fuels, and methods for making the same. Such dimers, due to their particular structure and conformation, disrupt the regular packing of linear saturated fatty acid methyl esters, thereby delaying nucleation and mitigating crystal growth.
WO2014138993	TRENT UNIVERSITY (CA)	**Polymorphism and microstructure of certain triacylglycerols and fatty acid methyl esters.** This application relates to the polymorphism and microstructure of certain triacylglycerols and fatty acid methyl esters, and how the properties of these individual components in a biodiesel fuel, as well as their combined mixtures, helps understand the fundamental mechanisms of their crystallization so as to design biodiesel fuels with improved low temperature characteristics.
EP2778805	ROCKWELL AUTOMATION TECH INC (US)	**Advanced process control of a biodiesel plant.** A system includes a biodiesel production system and an advanced process controlled configured to implement a model predictive control algorithm to control one or more aspects of the biodiesel production system.
WO2014115356	NAT INST OF ADVANCED IND SCIEN (JP)	**Transesterification catalyst and method for producing biodiesel fuel using transesterification catalyst.** The purpose of the present invention is to provide: a catalyst for the production of a biodiesel fuel, which is capable of producing a biodiesel fuel with high selectivity and high yield at low cost even in the presence of a moisture content and a free fatty acid; and a method for producing a biodiesel fuel using this catalyst. The present invention enables the production of a biodiesel fuel with high selectivity and high yield by transesterification between a fat or oil and an alcohol by using, as a transesterification catalyst, a titanium-containing mesoporous silica that contains Ti and Si as skeleton constituent elements and has a pore diameter of 5 nm or more.
WO2014122505	UNIV PALERMO (IT), et al	**Apparatus for the synthesis on a catalytic bed and for the separation of liquid-liquid-gas phases.** Synthesis apparatus on catalytic bed and separation of synthetic products comprising a gaseous phase and two liquid phases, a heavier liquid phase and the other liquid phase lighter, the apparatus comprising - a synthesis module (M1) comprising a first tube provided with an opening at one end and closed at a second end by a mesh, the first tube being adapted to contain a catalytic bed (6) therein; - and a separation module (M2) for separating the two liquid phases and the gaseous phase originating from the synthesis module (M1), comprising a second tube (V) arranged adjacent to the second end of the first tube, communicating therewith at a first end thereof, and having, at a second end thereof, a first closure element that is provided with a through hole. Use: Apparatus e.g. reactor/separator for synthesizing and separating synthesis products e.g. gaseous phase and heavier and lighter liquid phases on catalytic bed, used in production of biodiesel.
WO2014122579	CONSIGLIO NAZIONALE RICERCHE (IT)	**One-pot process for the production of biodiesel and glycerol ether mixtures useful as biofuels.** The present invention relates to a process for the conversion of a feedstock containing one or more fatty acid triglycerides to a mixture containing one or more fatty acid alkyl esters and t-alkyl glycerols, comprising reacting said feedstock with a compound of formula (I): R-O-RI (I) wherein: RI is an alkyl, alkenyl or alkynyl having 1-18 carbon atoms; R is H or a tertiary alkyl group, wherein said reaction takes place in the presence of an acid transesterification catalyst by irradiation with microwaves and/or ultrasound and/or radio waves.
WO2014119982	GONZÁLEZ ESTRADA PEDRO GABRIEL (MX)	**Reactor, method and system for transesterification by means of ultrasonic cavitation.** The present invention describes a novel system for the transesterification of triglycerides by means of the application of ultrasonic vibration waves with at least two main resonance frequencies and multiple harmonic frequencies selected in order to interact with the reactant molecules.

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WO2014111598	TOTAL RES & TECHNOLOGY FELUY (BE)	**A process for the production of bio-naphtha from complex mixtures of natural occurring fats & oils.** The invention relates to a process for making a bio-diesel and a bio-naphtha from a complex mixture of natural occurring fats & oils, wherein said complex mixture is optionally subjected to a refining treatment for removing the major part of the non-triglyceride and non-fatty acid components, thereby obtaining refined oils; said complex mixture or refined oils are subjected to a hydrolysis step for obtaining glycerol and a mixture of free fatty acids; said mixture of free fatty acids are subjected to a fractionation step for obtaining: a liquid or substantially liquid free fatty acids part (phase L); and a solid or substantially solid free fatty acids part (phase S); and said phase L is transformed into alkyl-esters as bio-diesel by an esterification; said phase S is transformed into linear or substantially linear paraffins as the bio-naphtha: by hydrodeoxygenation or decarboxylation of the free fatty acids; or from said phase S are obtained fatty acids soaps that are transformed into linear or substantially linear paraffins as the bio-naphtha by decarboxylation of the soaps.
WO2014116307	KIOR INC (US)	**Composition for reducing polynuclear aromatic hydrocarbon emissions.** Emissions of polynuclear aromatic hydrocarbons (PAHs) from diesel engines may be reduced by blending a renewable hydrocarbon distillate with a base diesel fuel. The base diesel may be a fossil diesel fuel, a Fischer-Tropsch diesel fuel as well as a hydroprocessed biodiesel fuel or a combination thereof. The renewable hydrocarbon distillate is a fraction from hydrotreated bio-oil having a boiling point between from about 320 DEG F to about 700 DEG F.
WO2014109438	KOREA RES INST OF BIOSCIENCE (KR)	**High starch and high lipid producing microalgae cholorella cell strain isolated from artic ocean and use therefor.** The present invention relates to a new microalgae Chlorella sp. for accumulating a functional starch and lipid at high concentrations. The cell strain Chlorella sp. ArM29B according to the present invention has been confirmed to be a cell strain for accumulating starch and lipid at high concentrations during culturing, is enabled to be cultured in various temperature conditions, and has been confirmed to accumulate lipids at a high concentration by nile red analysis, in which a neutral oil drop can be specifically dyed in a cell, thereby enabling the cell strain to be used as a material for a biodiesel and functional lipid production. In addition, the cell strain Chlorella sp. ArM29B is suitable as a microalgae for a biodiesel use since lipids are accumulated at a high concentration during culturing, does not need a special temperature condition during culturing since the cell strain grows well at at least freezing temperature, and can be cultivated and produced throughout the year because the cell strain grows well in all of spring, summer, autumn, and winter.
WO2014102254	ENI SPA (IT)	**Process for the production of lipids from biomass.** Process for the production of lipids from biomass including at least one polysaccharide, which comprises fermentation of a biomass hydrolysate using an oleaginous microorganism and separation of oleaginous cellular biomass comprising lipids. An aqueous fraction obtained by reverse osmosis of a spent fermentation broth is recycled as a feed for growth of the oleaginous microorganism. The lipids thus obtained can be advantageously used in the production of biodiesel or green diesel which can be used as such, or in a mixture with other automotive fuels.
WO2014102796	TRANS BIO DIESEL LTD (IL)	**Enzymatic transesterification/esterification processing systems and processes employing lipases immobilized on hydrophobic resins.** Disclosed are processing systems and processes for carrying out enzymatic batchwise or continuous process for the production of fatty acid alkyl esters for use in the biofuels, food, cosmetics, pharmaceuticals and detergents industries.
WO2014094093	UNIV FED DO PARANÁ (BR)	**Method for separating and/or purifying biodiesel using pressurized carbon dioxide.** The present invention relates to a method for separating and/or purifying biodiesel using pressurized carbon dioxide. Said method can be used in any process for producing biodiesel using any source of raw material. The method consists of injecting 10 to 50% CO2 into the system after the reaction and increasing the pressure of the system in a range of 5 to 20 Mpa at room temperature. Two phases are formed, wherein the upper phase is rich in biodiesel and alcohol, and the bottom phase is made of alcohol, monoacylglycerol, diacylglycerol, unreacted oil, salts and glycerine. The phases can be removed using a pressure vessel equipped with a one-way valve.

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WO2014094007	NAUER GERHARD (AT), et al	**Method for producing a biodiesel fuel having a specially designed reactor and "autocatalytically" active nanoscale structured material surface of the reactor.** The invention relates to a method for economical production of biodiesel specifically from free fatty acids, as are present in particular in used cooking oils, used cooking fats, different animal fats and biological fats or oils, wherein the raw material, in admixture with a monovalent alcohol, preferably methanol, is fed to a reactor that is specially constructed from "(auto)catalytically" active material having a nanoscale surface structure and is correspondingly designed, and is reacted at a defined temperature at relatively high pressures. The method is characterised in that the method is carried out without an external catalyst (liquid or solid) and the products diesel and glycerin occurring during the transesterification therefore accumulate substantially free from metallic impurities. The resulting products comply with the relevant quality standards.

VT BIOMASA PATENTES

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