

VI PATENTES

BIOMASA

10

Vigilancia Tecnológica
2º semestre 2013



Esta publicación del Boletín de Vigilancia Tecnológica en el sector de Biomasa surge de la colaboración entre la OEPM, BIOPLAT (Plataforma Tecnológica Española de la Biomasa) y el CIEMAT (Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas), organismo que forma parte de la referida plataforma y recoge una selección de las patentes más relevantes publicadas en el sector durante el segundo semestre de 2013.

Estos boletines, que en 2014 pasaran a ser trimestrales pretenden ofrecer una información puntual, esquemática y de rápida lectura sobre las últimas patentes publicadas relativas a las tecnologías de conversión de la biomasa para producir calor, electricidad y biocombustibles. Este número incluye también un estudio sobre la biomasa sólida en la Unión Europea (madera, residuos de madera, virutas u otro tipo de residuo animal o vegetal).

Si se desea recibir este Boletín periódicamente basta con cumplimentar el correspondiente formulario de suscripción.

Se puede acceder al listado de solicitudes de patentes para cada grupo analizado pulsando en los distintos apartados del sumario.

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BIOMASA SÓLIDA EN LA UNIÓN EUROPEA

En la Unión Europea, según las previsiones facilitadas por el Observatorio Europeo de Energías Renovables (EurObserv'ER), la producción de energía en 2012 a partir de biomasa sólida (madera, residuos de madera, virutas u otro tipo de residuo animal o vegetal) fue de 82,3 millones de toneladas equivalentes de petróleo (Mtep), un 5,4% más que en 2011, cuyo invierno, excepcionalmente templado, acabó con el aumento interrumpido del sector desde 1999 (Figura 1).

Todos los países de la Unión Europea utilizan la biomasa sólida con fines energéticos. Los cinco países que se encuentran a la cabeza en la producción de este tipo de energía son Alemania, Francia, Suecia, Finlandia y Polonia (Tabla 1) y conjuntamente representan el 56% de la producción de energía. No obstante, en la clasificación per capita, son Finlandia, Suecia, Estonia, Austria y Letonia los cinco países que encabezan el uso más extendido de la biomasa sólida, variando desde 1,47 a 0,55 tep/habitante (Figura 2). España es el sexto país de la UE en producción de energía primaria a partir de biomasa sólida, con 4,8 Mtep y el octavo en consumo con la misma cantidad (Tabla 1).

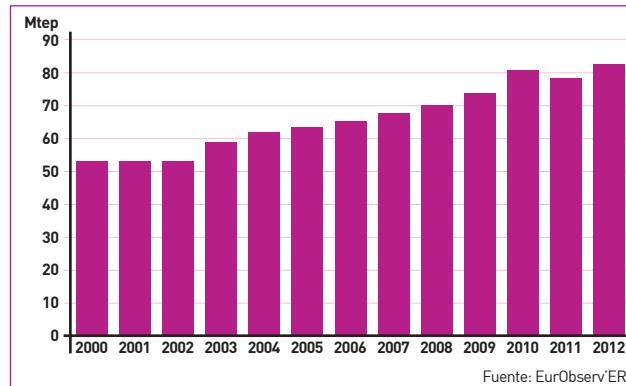


Figura 1.- Evolución de la producción de la energía primaria a partir de biomasa sólida en la Unión Europea

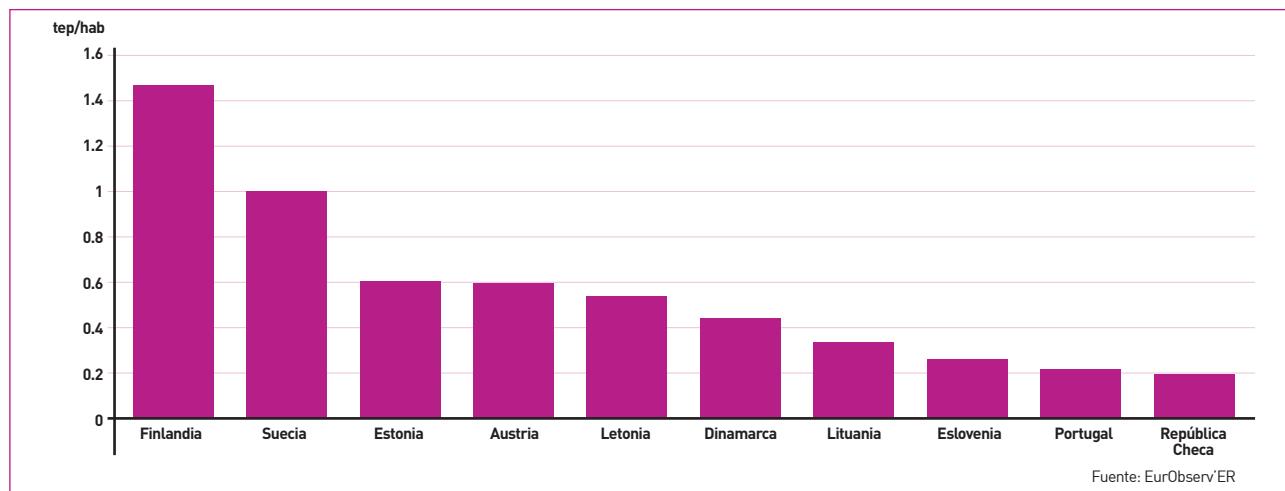


Figura 2. Producción de energía primaria a partir de biomasa sólida en tep/habitante en la Unión Europea

Otro dato importante es que el consumo bruto de energía primaria de biomasa sólida, incluyendo importaciones y exportaciones, se estima en 85,7 Mtep (Tabla 1), experimentando un crecimiento de 5,8% con respecto a 2011. La razón principal de esta diferencia es la cada vez mayor afluencia de pelets importados de Estados Unidos y Canadá. Según los datos de GTIS (Global Trade Atlas Services) Estados Unidos se convirtió, en 2012, en el principal exportador de pelets a la Unión Europea (1,764 Mt), seguido de Canadá (81,346 Mt). Otros países que proveen a la UE son: Rusia (0,637 Mt), Ucrania (0,217 Mt) y Bielorrusia (0,112 Mt).

	2011		2012	
	Producción	Consumo	Producción	Consumo
Alemania	11,054	11,054	11,811	11,811
Francia	9,089	9,089	10,457	10,457
Suecia	8,934	8,934	9,449	9,449
Finlandia	7,607	7,593	7,919	7,945
Polonia	6,350	6,350	6,851	6,851
España	4,812	4,812	4,833	4,833
Austria	4,537	4,681	4,820	5,029
Italia	3,914	5,127	4,060	5,306
Rumania	3,476	3,459	3,470	3,470
Portugal	2,617	2,617	2,342	2,342
República Checa	2,079	1,959	2,153	2,057
Reino Unido	1,623	2,240	1,810	2,473
Letonia	1,741	1,121	1,741	1,121
Dinamarca	1,499	2,384	1,489	2,473
Hungría	1,429	1,435	1,429	1,435
Bélgica	1,105	1,516	1,105	1,516
Holanda	1,000	1,322	1,099	1,350
Estonia	0,939	0,794	1,012	0,814
Grecia	0,940	1,036	1,000	1,136
Lituania	0,983	0,914	0,992	1,003
Bulgaria	0,834	0,961	0,974	1,275
Eslovaquia	0,784	0,760	0,717	0,717
Eslovenia	0,566	0,566	0,560	0,560
Irlanda	0,190	0,203	0,195	0,212
Luxemburgo	0,046	0,042	0,048	0,043
Chipre	0,005	0,012	0,005	0,012
Malta	0,001	0,001	0,001	0,001
Total	78,152	80,983	80,983	85,689

Fuente: EurObserv'ER

Tabla 1. Producción y consumo de energía primaria (Mtep) a partir de biomasa sólida en 2011 y 2012

La electricidad producida a partir de biomasa sólida en la Unión Europea en 2012 ascendió a 79,5 TWh, de los cuales un 66,8% fueron producidos en centrales de cogeneración. En Suecia, Polonia, Dinamarca, Lituania, Eslovenia y Bulgaria toda la energía eléctrica producida a partir de biomasa sólida procede de plantas de cogeneración (Tabla 2). En Finlandia la cogeneración supone el 83% de la generación eléctrica. La mayor cantidad de energía procedente de biomasa sólida se produjo en Alemania (12,191 TWh), Finlandia (10,385 TWh) y Suecia (10,240 TWh). En este caso cabe destacar que aunque el 2012 ha sido un año adverso para España por la legislación que limita el crecimiento de este sector, ese año se llegó a alcanzar una producción de electricidad de 3,4 TWh permitiendo que España ascienda al octavo puesto (Tabla 2).



	2011			2012		
	Centrales eléctricas	Plantas de cogeneración	Electricidad Total	Centrales eléctricas	Plantas de cogeneración	Electricidad Total
Alemania	4,901	6,396	11,297	5,288	6,903	12,191
Finlandia	1,800	9,018	10,818	1,728	8,657	10,385
Suecia	0,000	9,641	9,641	0,000	10,240	10,240
Polonia	0,000	7,149	7,149	0,000	9,477	9,477
Reino Unido	5,606	0,000	5,606	7,046	0,000	7,046
Holanda	2,328	1,649	3,977	2,383	1,577	3,960
Austria	1,153	2,578	3,701	1,379	2,398	3,777
España	1,572	1,365	2,937	1,813	1,574	3,387
Dinamarca	0,000	3,078	3,078	0,000	3,176	3,176
Bélgica	1,958	1,167	3,125	1,949	1,162	3,111
Italia	1,668	0,845	2,512	1,545	1,024	2,569
Portugal	0,745	1,722	2,467	0,786	1,710	2,496
Francia	0,202	1,964	2,166	0,208	2,022	2,230
República Checa	0,756	0,928	1,684	0,468	1,348	1,816
Hungría	1,396	0,131	1,527	1,195	0,112	1,307
Estonia	0,327	0,439	0,766	0,404	0,581	0,985
Eslovaquia	0,000	0,682	0,682	0,000	0,636	0,636
Rumania	0,085	0,104	0,189	0,096	0,116	0,211
Irlanda	0,120	0,016	0,137	0,164	0,016	0,180
Lituania	0,000	0,121	0,121	0,000	0,175	0,175
Eslovenia	0,000	0,125	0,125	0,000	0,114	0,114
Bulgaria	0,000	0,037	0,037	0,000	0,037	0,037
Letonia	0,003	0,010	0,013	0,003	0,010	0,013
Total	24,620	49,134	73,755	26,454	53,065	79,519

Fuente: EurObserv'ER

Tabla 2. Producción de electricidad primaria [TWh] a partir de biomasa sólida en 2011 y 2012

En 2012 se consumió en la Unión Europea 68,0 Mtep de calor, y dentro de este global destacan como principales consumidores Francia y Alemania, con 9,9 Mtep y 8,7 Mtep, respectivamente; España se encuentra en la octava posición (Tabla 3). La producción de calor (*sales to heating network*) aumentó un 12,9% hasta los 7,9 Mtep y en esta lista Suecia, Finlandia, Dinamarca, Austria y Alemania, por este orden, ocupan los primeros puestos; aunque hay que destacar que en este caso no aparecen datos de algunos países, entre los que se encuentra España (Tabla 3).

	2011		2012	
	Producción	Consumo	Producción	Consumo
Francia	-	8,627	-	9,900
Alemania	0,444	8,269	0,555-	8,700
Suecia	2,0472	7,485	2,356	7,846
Finlandia	1,471	5,904	1,631	6,322
Polonia	0,343	5,078	0,498	5,298
Austria	0,801	3,802	0,819	4,093
Italia	0,241	3,948	0,229	3,936
España	-	3,776	-	3,776
Rumania	0,048	3,470	0,048	3,206
Dinamarca	0,841	1,919	0,943	2,020
Portugal	-	2,149	-	1,802
República Checa	0,071	1,582	0,070	1,642
Bulgaria	0,009	0,946	0,012	1,265
Grecia	-	1,033	-	1,133
Hungría	0,062	1,002	0,059	1,059
Letonia	0,090	1,048	0,070	1,048
Reino Unido	0,023	0,862	0,032	0,890
Lituania	0,188	,0865	0,240	0,878
Bélgica	0,007	0,814	0,007	0,814
Estonia	0,169	0,665	0,179	0,654
Eslovenia	0,019	0,539	0,012	0,537
Eslovaquia	0,101	0,525	0,090	0,499
Holanda	0,046	0,454	0,043	0,459
Irlanda	-	0,172	-	0,175
Luxemburgo	0,003	0,042	0,003	0,044
Chipre	-	0,011	-	0,011
Malta	-	0,000	-	0,000
Total	7,026	64,989	7,933	68,008

Fuente: EurObserv'ER

Tabla 3. Producción y consumo de calor (Mtep) a partir de biomasa sólida en 2011 y 2012



ANÁLISIS DE PATENTES

Durante el segundo semestre de 2013 se han identificado en la base de datos WPI (World Patent Index) 2.998 familias de patentes sobre Tecnologías de conversión de la biomasa para la producción de energía. De la Tabla 4 se desprende que, aproximadamente, el 49% de las referencias encontradas están relacionadas con las tecnologías bioquímicas y el 40% con termoquímicas. La tecnología de digestión anaeróbica es la que cuenta con mayor número de resultados, 40% de los totales.

Tipos de tecnologías de conversión de la biomasa	2º semestre. 2013
Tecnologías termoquímicas	1.196
Combustión directa	545
Gasificación/pirólisis	651
Tecnologías bioquímicas	1.457
Digestión anaeróbica	1.184
Fermentación de azúcares	273
Tecnologías químicas (transesterificación, Fischer-Tropsch síntesis de metanol)	345
Nº TOTAL FAMILIAS DE PATENTES	2.998

Tabla 4. Número de familias de patentes clasificadas por tecnologías

En la Tabla 5 se muestran los países líderes. El liderazgo lo sostiene China con 1.841 solicitudes de patente, le siguen las solicitudes internacionales (PCT), menos del 80% con respecto a las chinas. En tercer y cuarto lugar se encuentra EE.UU y Japón con 232 y 203 solicitudes, respectivamente. Durante este semestre solo se han publicado 10 solicitudes españolas.

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

País	Nº referencias
1 China (CN)	1.841
2 Patente PCT (WO)	407
3 EE.UU. (US)	232
4 Japón (JP)	203
5 Corea (KR)	196
6 Alemania (DE)	65
7 Patente Europea (EP)	53
8 Brasil (BR)	38
9 Rusia (RU)	35
10 Índia (IN)	30
11 Francia (FR)	25
12 Polonia (PL)	24
13 Taiwan (TW)	22
14 Canadá (CA)	15
15 México (MX)	11

Tabla 5. Ranking por países.



TECNOLOGÍAS TERMOQUÍMICAS

Patentes

COMBUSTIÓN DIRECTA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2013178198	Flamet S R O (CZ)	<p>Downdraft vertical pellet burning equipment. Vertical pellet burning equipment with a downwards burning flame, containing a burn-pot a grate and a supply bin. The gasifying space situated above the grate and connected with gravitation duct to the supply bin situated above the gravitation duct. Furthermore it comprises a device to close pellet feeding, a primary air inlet, a secondary air inlet, an ignition opening, a jet, a control of air supply, and a closure of the ignition opening. Primary air inlet is directed into the gasifying space above the grate. Pyrolysis gases pass through the grate downwards into a jet passage that guides the gases into a burn-pot, where they are mixed with secondary air and completely burnt with a visible flame. Originating from below the grate, the jet passage is directed downwards. Optionally the jet passage may be directed horizontally sideways or U-shaped upwards.</p>
WO2013171547	Babcock & Wilcox Voelund AS (DK) et al.	<p>Heat exchanger having enhanced corrosion resistance. The present invention provides a heat exchanger for heating a fluid in an incineration plant, the incineration plant in operation producing a flue gas, the heat exchanger comprising at least one heat exchanger component comprising a wall having a first side in contact with the fluid, and a second side in contact with the flue gas, the second side being provided with a protective oxide for protecting the heat exchanger component against corrosion caused by corrosive compounds entrained or comprised by the flue gas, wherein the protective oxide comprises alpha-Al₂O₃. A method of forming a scale for protecting a heat exchanger component against corrosion caused by corrosive compounds entrained or comprised by a flue gas is also provided.</p>
WO2013159782	SKAMOL AS (DK)	<p>Catalytic unit for solid fuel burning stoves. This invention describes a stove comprising a combustion chamber and a flue for removing exhaust from said combustion chamber, where said combustion chamber and said flue are connected via a passageway; said combustion chamber comprising a top and a bottom, where said top and said bottom are connected by one or more sides; a catalytic unit arranged between said combustion chamber and said flue in said passageway; said catalytic unit provides a guide way for the exhaust, where said catalytic unit comprises at least one isolating members and at least one catalytic member, said catalytic member comprising a first wave-like structure, said first wave-like structure being provided on at least one catalytic surface of said catalytic member and, in use, at least partly being in contact with the exhaust and, where, in use, the direction of the exhaust is substantially transverse to the waves of said first wave-like structure.</p>
WO2013159267	Zhu Hongfeng (CN) et al.	<p>Biomass fuel stove. A biomass fuel stove uses biomass fuel particles, and comprises a body capable of being placed on the ground. The body comprises a top surface and a side surface extending from the periphery of the top surface downwards to the ground, and is provided with a combustion portion and an auxiliary equipment portion. The combustion portion comprises a combustor. The combustor has a fuel frame, a combustion area is formed above the fuel frame, and a blast area is formed below the fuel frame. A plurality of vent holes is provided on the fuel frame. An air supplement device is provided above the combustion area, and the air supplement device comprises a cylindrical inner wall and an air feed chamber encircling the cylindrical inner wall. The blast area is in communication with the air feed chamber, and is supplied with supplementary oxygen uniformly by a blower through an air feed pipe. The auxiliary equipment portion is provided with electrical equipment, and the electrical equipment comprises the blower, a power supply, and a power supply switch. The cylindrical inner wall of the air supplement device is provided with at least one row of positive air shift devices and at least one row of negative air shift devices.</p>

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013142945	Canada Natural Resources (CA)	Upplemental burner for conversion of biomass and related solid fuel. A conversion burner, a system of conversion burners, and a method of conversion of a solid fuel selected from at least one of biomass and peat. The burner is constructed and arranged to be affixed to a combustor, and comprises a housing defining a burner chamber; a grate within the burner chamber defining an upper chamber region and a lower chamber region; at least a first solid fuel inlet; at least a first air inlet operatively connected to the upper chamber region and connectable to a first air source; a product gas outlet operatively connected to the combustion region of the combustor; and at least one waste outlet. The product gas is delivered to the combustor for firing or co-firing, overcoming fouling problems which result from direct delivery of solid fuel to the combustor, and problems raised by remote conversion or storage of solid fuel.
WO2013141311	Kawasaki Heavy Ind Ltd (JP)	Pulverized coal/biomass mixed-combustion burner and fuel combustion method. Provided is a pulverized coal/biomass mixed-combustion burner capable of combusting large volumes of biomass fuel as an auxiliary fuel, and capable of combusting only pulverized coal if there is insufficient biomass fuel. The pulverized coal/biomass mixed-combustion burner comprises: a biomass fuel jet nozzle that follows the axis of the pulverized coal/biomass mixed-combustion burner; a pulverized coal fuel jet nozzle that surrounds the biomass fuel jet nozzle; a secondary air nozzle that surrounds the pulverized coal fuel jet nozzle; and a tertiary air nozzle that surrounds the secondary air jet nozzle. The pulverized coal/biomass mixed-combustion burner is configured so as to jet a biomass fuel flow to the inner side of a pulverized coal fuel flame having good ignition and flame stability and formed inside a furnace.
WO2013116946	Sherwood Ind Ltd (CA)	Pellet kamado cooker. A cooker includes a cooking chamber having a high heat capacity and a heating assembly that generates heat energy by combusting pellets. The cooking chamber and the heating assembly are connected such that the heat energy generated by the heating assembly transfers from the heating assembly to the cooking chamber. The heating assembly may be outside the cooking chamber.
WO2013111929	Kiturami Boiler CO Ltd (KR) et al.	Gun-type burner for pellet boiler. The present invention relates to a gun-type burner for a pellet boiler and, particularly, to a gun-type burner for a pellet boiler which provides a constant pressure primary air supply and secondary air supply respectively to the top and bottom of a combustion plate at which the ignition of pellet fuel occurs, so as to provide an optimized combustion environment and enable the complete combustion of pellet fuel. Also, the present invention relates to a gun-type burner for a pellet boiler which uses a gun-shaped combustion acceleration tube as a fire furnace which is highly resistant to thermal deformation as compared to the use of existing square-shaped fire furnaces which have low resistance to thermal deformation, wherein the gun-type burner is easy to form and manufacture and can also lower raw material costs.
EP2629012	Scimone Roberto (IT) et al.	Pellet stove with system of self-cleaning of the brazier. Pellet stove comprising a case which is internally provided with a hopper for containing the pellets for feeding to a brazier provided with holes for the entry of combustion air aspirated, through a pressure drop, by a flue gas extraction fan, wherein the base wall of said brazier is formed by a section provided with said holes for the entry of the combustion air of a pipe having at least one end open, mounted so as to be able to rotate around its axis.
EP2629007	Northern Light Stoves CO Ltd (JP)	Combustion apparatus. Provided is a combustion apparatus, including: a fire chamber for combusting wood pellets; a thermoelectric power generation module disposed outside the fire chamber for generating power based on a temperature difference caused by heating with an internal temperature of the fire chamber and by cooling with an external temperature outside the fire chamber; and an electric drive means (an exhaust fan, a blast fan, a drum-type pellet supply system, an ignition heater, an air supply fan) which operates using, as a drive force, thermoelectric power generated by the thermoelectric power generation module.

COMBUSTIÓN DIRECTA

Nº Publicación	Solicitante (País)	Contenido técnico
ES2408809	Grupo Clavijo Elt SL (ES)	Modulo transportable para la produccion de agua caliente mediante combustión de biomasa. Módulo transportable para la producción de agua caliente mediante combustión de biomasa, constituido por un contenedor que comprende en su interior una zona de almacenaje de biomasa y una zona de combustión de biomasa, estando ambas zonas aisladas entre sí por medio de un tabique de separación, y en donde la zona de combustión de biomasa dispone una caldera de combustión de la biomasa y un depósito con agua a calentar por el calor generado de la combustión de la biomasa, y en donde el contenedor dispone unos medios de transferencia para llevar la biomasa desde la zona de almacenaje de biomasa hasta la caldera de combustión.
EP2615369	Cheap Heat B V (NL)	Heating device. Heating device comprising: - a primary fire chamber for burning a fuel, such as wood, the primary chamber having an air inlet and a flame outlet; - a secondary fire chamber with a flame inlet at the top of the chamber and a flue gas outlet; - air circulation means for feeding air into the air inlet of the primary fire chamber wherein the secondary fire chamber is below the primary fire chamber with respect to the direction of gravity, wherein the flue gas outlet is arranged at a distance from the bottom of the secondary fire chamber such that an ash collection space is provided between the bottom of the secondary fire chamber and the flue gas outlet.
ES1078884	Lago Bouzon Fernando R (ES) et al.	Quemador de Biomasa. Quemador de biomasa, previsto para sustituir a los clásicos quemadores de gas o gasoil, y estando previsto para su aplicación directa en equipos de calefacción, calderas, hornos industriales o procesos industriales que requieran aporte de calor, caracterizado porque se constituye a partir de una carcasa en cuyo interior está establecida una hornilla como cámara de combustión a la que accede el combustible, a base de residuos orgánicos y/o vegetales, realizándose la alimentación de dicho combustible por simple gravedad o mediante una aportación mecánica, con la particularidad de que la hornilla como cámara de combustión incluye una chapa de cierre posterior y un aro que establece un cierre hermético posterior de dicha hornilla, mientras que en su parte anterior va una chapa de cierre con ventana para el acoplamiento del elemento de aporte de combustible.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
ES2427018	Fundacion CT de Innovacion y Desarrollo Tecnologico (ES)	Procedimiento para obtener energia electrica renovable a partir de la biomasa y dos motores de combustion. El proceso consiste en partiendo de biomasa, la hacemos pasar por un horno de parrilla utilizado para realizar la pirólisis de esta, intercambiador de calor para rebajar la temperatura de salida de los gases y una filtración de los gases de combustión de la pirólisis. A continuación se combustionan en motor de gas, y se genera electricidad. Tomamos de nuevo biomasa, carbón formado en la pirólisis inicial y los gases de salida del motor de gas. Lo pasamos por horno de parrilla para la formación de CO, intercambiador de calor para rebajar la temperatura y filtración de los gases de combustión, este CO lo pasamos por motor de combustión de gas y generamos electricidad.
EP2666845	Dogru Murat (GB)	Gas producing apparatus. A gas production apparatus is disclosed. The apparatus comprises a receptacle for receiving and processing carbonaceous material and or carbonaceous solid fuel and or fuel containing hydrocarbon(s) passing therethrough, the receptacle defining a flaming pyrolysis zone in which carbonaceous material is heated in the presence of partial oxygen to generate volatile gases, and a gasification zone in which carbonaceous material is to generate volatile gases and char-ash. A first agitator has a stirrer and blades for agitating carbonaceous material in the flaming pyrolysis zone and a hollow air pipe for introducing air into the flaming pyrolysis zone. A second agitator has rotating double shaft and hallow blades for grinding and moving fused char and for introducing air and or water to the gasification zone via air and water pipes. Gas discharge pipes enable removal of volatile gases from the receptacle.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
EP2666846	Grupo Guascor SL (US)	<p>Biomass feeding system. A method and a system are provided for feeding a biomass material feed into a fluidized bed gasifier. The system includes a first plurality of screw conveyors disposed circumferentially around and connected to or integral with a gasifier shell of the fluidized bed gasifier, such that each of the first plurality of screw conveyors is in feed communication with a gasifier chamber defined by the gasifier shell. The system also includes a plurality of secondary receptacles, each individually coupled to a respective screw conveyor of the first plurality of screw conveyors, such that each of the plurality of secondary receptacles includes a secondary receptacle shell defining a secondary receptacle chamber in feed communication with the respective screw conveyor. The system further includes a plurality of primary receptacles, each including a primary receptacle shell defining a primary receptacle chamber in feed communication with at least two of the plurality of secondary receptacles.</p>
WO2013172301	Japan Blue Energy CO Ltd (JP)	<p>Biomass gasifier device. The present invention provides a device which makes it possible not only to significantly decrease the hassle caused by tar and the like generated by pyrolyzing biomass and to maximize the rate of gasification of the tar generated, but also to produce hydrogen-containing gas from biomass at high thermal efficiency and low cost. A gasifier device, provided with: a biomass pyrolysis zone for heating biomass in a non-oxidizing gas atmosphere; and a gas reforming zone for heating, in the presence of steam, pyrolyzed gas thus generated; a plurality of heated granules and/or lumps being moved from the gas reforming zone to the biomass pyrolysis zone to reform pyrolyzed biomass gas and to pyrolyze biomass using the heat possessed by the plurality of granules and/or lumps. The gasifier device is characterized in that the biomass pyrolysis zone and the gas reforming zone are provided in a single vessel, and at least one partitioning plate is provided between the biomass pyrolysis zone and the gas reforming zone.</p>
WO2013171457	Chinook end Stage Recycling Ltd (GB)	<p>Improvements in waste processing. This invention provides a system and method for pyrolysing and/or gasifying material such as organically coated waste and organic materials including biornass, industrial waste, municipal solid waste and sludge. In a first mode of operation the method/system heats the material in a processing chamber (10) by passing hot gas therethrough. This pyrolyses and/or gasifies the organic content it to produce syngas and, invariably, soot. In a second mode of operation the method/system increases the oxygen content of the hot gas such that the oxygen within the hot gas reacts with the heated soot to form carbon monoxide.</p>
WO2013169461	Exxonmobil Chem Patents INC (US)	<p>Production of olefins and aromatics. In a process for producing olefins and aromatic hydrocarbons, a feed comprising a biomass pyrolysis oil or a fraction thereof is supplied to a steam cracking unit operating at a temperature of 600 DEG C to 1000 DEG C or a reverse flow reactor operating at a temperature of 900 DEG C to 1,700 DEG C and is thermally cracked to produce one or more hydrocarbon effluent fractions.</p>
WO2013154910	Primus Green Energy INC (US)	<p>Catalytical gasifier configuration for biomass pyrolysis. The invention relates to systems and methods for producing synthesis gas. In particular, the systems of the present invention include two catalytic reactors in series, a wet reformer/gasifier followed by a dry reformer. The systems produce synthesis gas with very little to no methane.</p>
WO2013154938	Ber Technology Company LLC (US)	<p>System and method for densification of renewable coal replacement fuel. A method may include heating biomass to generate torrefied biomass. The method may also include applying a liquid to the torrefied biomass in order to cool the torrefied biomass and increase moisture content of the torrefied biomass. The method may further include densifying the torrefied biomass into pieces having a second specific density greater than a first specific density of the torrefied biomass prior to densification.</p>

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013152337	Full Circle Biochar INC (US) et al.	Biochar compositions and methods of use thereof. The invention provides for methods, devices, and systems for pyrolyzing biomass. A pyrolysis unit can be used for the pyrolysis of biomass to form gas, liquid, and solid products. The biomass materials can be selected such that an enhanced biochar is formed after pyrolysis. The biomass can be pyrolyzed under specified conditions such that a selected biochar core is formed. The pyrolysis process can form a stable biochar core that is inert and/or resistant to degradation. The biochar or biochar core can be functionalized to form a functionalized biochar or functionalized biochar core. Functionalized can include post- pyrolysis treatments such as supplementation with microbes or physical transformations including annealing and/or activation.
WO2013149170	All Power Labs INC (US)	Compact gasifier-genset architecture. A compact biomass gasification-based power generation system that converts carbonaceous material into electrical power, including an enclosure that encases: a gasifier including a pyrolysis module coaxially arranged above a reactor module, a generator including an engine and an alternator, and a hopper. The generator system additionally includes a first heat exchanger fluidly connected to an outlet of the reactor module and thermally connected to the drying module, a second heat exchanger fluidly connected to an outlet of the engine and thermally connected to the pyrolysis module, and a third heat exchanger fluidly connected between the outlet of the reactor module and the first heat exchanger, the third heat exchanger thermally connected to an air inlet of the reactor module. The system can additionally include a central wiring conduit electrically connected to the pyrolysis module, reactor module, and engine, and a control panel connected to the conduit that enables single-side operation.
WO2013140225	Doudenkov Igor A (RU) et al.	Device and method for disposing of solid domestic waste by means of high-temperature pyrolysis, using solar radiation. The invention relates to ecological methods and devices for disposing of solid domestic waste and wastewater sludge residues without exposure to oxygen. The device and method cause thermal decomposition.
WO2013134391	Res Triangle Inst (US)	Catalytic biomass pyrolysis process. Described herein are processes for converting a biomass starting material (such as lignocellulosic materials) into a low oxygen containing, stable liquid intermediate that can be refined to make liquid hydrocarbon fuels. More specifically, the process can be a catalytic biomass pyrolysis process wherein an oxygen removing catalyst is employed in the reactor while the biomass is subjected to pyrolysis conditions. The stream exiting the pyrolysis reactor comprises bio-oil having a low oxygen content, and such stream may be subjected to further steps, such as separation and/or condensation to isolate the bio-oil.
WO2013134770	Clingan William Rex (US)	Process for production of fuels and chemicals from biomass feedstocks. A process for the production of fuels and chemicals from biomass feedstock is provided. The process includes (a) drying the biomass feedstock using heated dry carbon monoxide gas; (b) devolatilizing the feedstock by reductive torrefaction with heated dry carbon monoxide gas; (c) pulverizing the feedstock; and (d) pyrolyzing the feedstock by reductive pyrolysis with high pressure or high temperature carbon monoxide gas. An integrated system for producing fuels and chemicals from biomass feedstock is also provided.
EP2636720	Finger Ulrich (DE)	Method and apparatus for the gasification of wet biomass with a compact gasification device. The device has an auger screw heated from outside by flue gas generated by firing wood chips, so as to produce water vapor. A pyrolysis auger is heated from outside, where dried wood chips are filled into a gasification pipe located underneath the pyrolysis auger through a shaft. Two gasification augers are fed in opposite directions with respect to each other at a moderate rotation speed so as to obtain higher dwelling time for gasification of biomass. A stumbling auger is subjected to heat by firing fresh material and residue carbon obtained after gasification.

PIRÓLISIS/GASIFICACIÓN		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2013129771	Nat Univ Chonbuk Ind Coop Foun (KR)	Fixed-bed biomass gasifier formed with swirling gas-injection port. The present invention relates to a fixed-bed biomass gasifier formed with a swirling gas-injection port. More particularly, a gasification agent is supplied in a swirling manner by forming the swirling gas injection port on the lower side of a gasification reactor in which a gasification reaction is carried out by supplying lignocellulosic biomass, and thus accelerates gasification by increasing the duration of contact between the swirling gasification agent and a pyrolysis layer. Also, a catalyst chamber is disposed in the upper portion thereof, at which an outlet is formed, so as to convert the tar contained in discharged synthetic gas into additional synthetic gas.
EP2641958	Stadtwerke Rosenheim GmbH & CO KG (DE)	Biomass gasifier. The gasifier has a gasification reactor including a pyrolysis unit an oxidization unit, and a reduction unit. A supplying unit supplies biomass into the pyrolysis unit. A conveying unit conveys the biomass by the pyrolysis unit. An opening supplies gasification agent into the oxidization unit. A dissipation unit drives off product gas e.g. hydrogen gas, from the reduction unit of the gasification reactor. A supplying unit is opened to supply the gasification agent in a middle part of the oxidization unit.
WO2013120721	Thyssenkrupp Uhde GmbH (DE) et al.	Bottom product cooling in a fluidized-bed gasification. With a method for cooling and pressure expansion of the bottom product produced in a fluidized-bed gasification of biomass, brown coal, hard coal with a high ash content, an economic solution for cooling and pressure expansion of the bottom product produced is to be ensured, which is achieved by the bottom product leaving the fluidized bed at a maximum of 1500 DEG C and a pressure of up 40 bar being fed to an intermediate store, then from the intermediate store to a pressure tank having a cooling system and then to an expansion system.
WO2013119187	Farkas Laszlo (SK)	Method for thermal decomposition of organic material and equipment for implementation of this method. Method of thermal decomposition of organic material from specified and/or mixed wastes from used tyres, plastics, paper, textiles, biomass and organic portions of municipal waste in an inert atmosphere without the participation of oxygen/air takes place continuously in a hermetically enclosed flow-type apparatus for thermal decomposition in such a way that the modified feedstock in the form of crushed material, shreds or chippings with the size of up to 350 mm is transported to the batching hopper, then it is transported by means of the batching spiral-type conveyor through the decomposition oil filling, which constitutes the input oil seal, to the tubular flow-type cracking reactor by means of the shifting spiral-type conveyor, where thermal cracking of material is taking place in the tubular flow-type cracking reactor; at the temperature of 165 to 750 DEG C at the atmospheric pressure from 100834.6675 Pa up to 101815.3325 Pa (i.e. at the atmospheric pressure from -50 mm up to +50 mm of water column) resulting in gaseous, liquid and solid products, wherein the gaseous decomposition products are further transported from the first part of the tubular flow-type cracking reactor through the outlet and through the outlet in the second part of the tubular flow-type cracking reactor into the condensation system, then the solid products are transported to the second part of the tubular flow-type cracking reactor by means of the spiral conveyor through the water cooler via the opening for the output of solid products to the output water seal constituting the hydraulic seal, from where the solid products are taken out by means of the in-feed conveyor; and the spiral-type out-feed conveyor. Equipment for thermal decomposition of organic material for implementation of the method of thermal decomposition consists of the tubular flow-type cracking reactor, which is positioned on the frame of the tubular flow-type cracking reactor at an angle of 8 to 38 degrees relative to the horizontal plane, whereas the tubular flow-type cracking reactor houses a shifting spiral conveyor the bottom part of which is submerged in the input oil seal, with the second part of the tubular flow-type cracking reactor being enclosed by the output water seal.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013110716	SGE Scandgreen Energy AB (SE)	Process and system for producing a fuel from a carbon-containing material using a plasma gasifier. A process and system for producing liquid and gas fuels and other useful chemicals from carbon containing source materials comprises cool plasma gasification and/or pyrolysis of a source material to produce synthesis gas using the produced synthesis gas for the production of a hydrocarbon, methanol, ammonia, urea, and other products. The process and system are capable of sequestering carbon dioxide and reducing NOx and SOx.
WO2013103872	KIOR INC (US)	Two-stage reactor and process for conversion of solid biomass material. A two-stage reactor/process is disclosed for the conversion of solid particulate biomass material and includes: a first stage, in which solid particulate biomass material is pyrolyzed to primary reaction products, and a second stage in which the primary reaction products are catalytically converted in a second stage which is operated at a temperature higher than that of the first stage.
WO2013099230	JFE Steel Corp (JP)	Hydrogen production method. In producing hydrogen by reforming organic matter, excess moisture vapour is added to an exhaust gas (g_0) containing carbon monoxide generated by a metallurgical furnace and a shift reaction is carried out, thereby constituting a mixed gas (g) containing hydrogen produced by the shift reaction, and carbonic acid gas, and water vapour not consumed by the shift reaction. Said mixed gas (g) is brought into contact with organic matter, bringing about a reforming reaction which reduces the molecular weight of the organic matter, and the product of the reforming reaction is steam reformed, thereby producing hydrogen.
WO2013094878	Korea Ind Tech Inst (KR)	Pyrolysis apparatus using liquid metal. A pyrolysis apparatus using a liquid metal according to the present invention comprises: a hollow reactor in which the liquid metal is accommodated; a circulation pump which is connected to the reactor; a buffer tank which is disposed on top of the reactor to receive the liquid metal from the circulation pump; a nozzle which is coupled with the buffer tank to inject the liquid metal in the buffer tank into the reactor; and an air supply source which supplies air to the liquid metal in the reactor. Char that is generated by fuel that is input into the reactor reacts for combustion with the air introduced by the air supply source into a lower portion of the reactor, and particles of the liquid metal that are injected through the nozzle react with gas generated in the reactor to refine the gas.
WO2013103321	Arbonexcel Pte Ltd (SG)	Method and apparatus for torrefaction of biomass materials. Embodiments of the invention provide a heat transfer element adapted for use in a rotary furnace for torrefaction and particle size reduction of biomass material. The heat transfer element is made up of a rounded object having a specific gravity substantially higher than a specific gravity of the biomass material to be torrefied, a heat capacity sufficient for the heat transfer elements in the rotary furnace to heat the biomass material to be torrefied, and a hardness sufficient for the heat transfer element to serve as grinding media to reduce the particle size of the biomass material to be torrefied. The heat transfer element has one or more surface features formed in a surface of the rounded object. The surface features are configured to increase traction between the heat transfer elements and the biomass material to be torrefied. A system for torrefaction and particle size reduction of biomass material, including a rotary furnace charged with heat transfer elements as described above, and a method for using such a system for torrefaction and particle size reduction of biomass material are also discussed.
WO2013103768	Univ Maine sys Board Trustees (US)	Formate-assisted pyrolysis. The present invention provides, among other things, methods for creating significantly deoxygenated bio-oils from biomass including the steps of providing a feedstock, associating the feedstock with an alkali formate to form a treated feedstock, dewatering the treated feedstock, heating the dewatered treated feedstock to form a vapor product, and condensing the vapor product to form a pyrolysis oil, wherein the pyrolysis oil contains less than 30% oxygen by weight.
WO2013098195	Bioecon Int Holding NV (NL) et al.	Optimized catalyst for biomass pyrolysis. An optimized catalyst system is disclosed for the pyrolysis of solid biomass material. The catalyst system is also suitable in upgrading reactions for biocrude. The system comprises a carbonate species on a substantially inert support. The carbonate species can be an inorganic carbonate and/or an inorganic hydrogencarbonate.

PIRÓLISIS/GASIFICACIÓN

Nº Publicación	Solicitante [País]	Contenido técnico
WO2013098525	Cogebio (FR)	<p>Method and apparatus for fixed bed gasification. A co-current fixed bed gasifier intended to convert biomass into synthesis gas and ash with the aid of a gasification agent, said gasifier comprising a reactor body, said reactor body comprising an upper part and a lower part, into which gasifier the biomass is introduced via an inlet duct located in the top of the upper part of the body of the gasifier; the synthesis gas is evacuated via a synthesis gas evacuation duct, and the ash is evacuated in the bottom part of the lower part of the reactor body through an ash evacuation duct, and said gasifier comprising, from top to bottom, - a biomass pyrolysis area, - a biomass oxidation area, - a reduction area, - a grid comprising a plurality of openings through which the ash passes to be evacuated, and said gasifier comprising means of introducing a gasification agent, such as air or oxygen, said gasifier being characterised in that said means of introducing the gasification agent comprise: a cone for diffusing the gasification agent located at the top of the oxidation area of the gasifier, or above said oxidation area, means of injecting the gasification agent located in the oxidation area of the gasifier.</p>

TECNOLOGÍAS BIOQUÍMICAS

Patentes

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante [País]	Contenido técnico
EP2669364	Energiutvecklarna Norden AB (SE)	<p>Biogas reactor. Biogas reactor comprising a housing with an inlet for organic material, a biogas outlet, a shaft having a material displacement device fixed thereto wherein the biogas reactor has at least two outlets, in a gas producing section of the reactor from which organic material can be returned to the inlet. A method using the biogas reactor for production of biogas is also disclosed.</p>
EP2666868	Niederbacher Michael (IT)	<p>Method and device for fermenting biomass containing nitrogen, in particular dry chicken manure, in a biogas assembly. Fermenting nitrogenous biomass, comprises (i) supplying the biomass into a mixing device, mixing a recirculate into the biomass to produce a mixture, supplying back the mixture into a fermenter, (ii) removing the fermentation residue, supplying the residue to a separator and separating the residue into a solid and a liquid phase, supplying only the liquid phase into a nitrogen removal device, reducing nitrogen in the liquid phase, producing a nitrogen-reduced fermentation residue liquid phase, and (iii) supplying nitrogen reduced liquid phase into the mixing device. Fermenting nitrogenous biomass, preferably poultry manure in a biogas plant, comprises (i) supplying the nitrogenous biomass, which is to be fermented, into a mixing device, mixing a defined amount of a recirculate into the biomass so that the nitrogen concentration of the produced biomass/recirculate mixture lies below a defined nitrogen threshold value, supplying back the biomass/recirculate mixture into at least one fermenter of the biogas plant and generating biogas, (ii) removing the fermentation residue from at least one fermenter, supplying the fermentation residue to a separator and/or a separator device and separating the fermentation residue into a fermentation residue solid phase and a fermentation residue liquid phase, supplying only the fermentation residue liquid phase into a nitrogen removal device, reducing or removing nitrogen in the form of ammonium and/or ammonia dissolved or bound in the liquid phase, producing a nitrogen-reduced, preferably a nitrogen-free, fermentation residue liquid phase, and (iii) supplying nitrogen reduced fermentation residue liquid phase into the mixing device in a defined time and amount as a recirculate. An independent claim is also included for a device for carrying out the fermentation of nitrogenous biomass, preferably poultry manure in the biogas plant by the above mentioned method, comprising the mixing device, the fermenter, which is connected downstream to the mixing device, the separator and/or separator device, which is connected downstream to the fermenter, the nitrogen removal device, which is connected downstream to the separator and/or separator device, and at least one recirculation device comprising a return line and/or an intermediate storage or a buffer reservoir, by means of which the nitrogen-reduced fermentation residue liquid phase is supplied as the recirculate to the mixing device.</p>

DIGESTIÓN ANAERÓBICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2013171326	Bailer Edwin (DE)	<p>Digester unit. The invention relates to a digester unit for producing biogas from digested sludge, comprising a digester that has passage openings which are able to be sealed shut and are used to fill the digester with digested sludge and to empty same; comprising a heating device for heating the digested sludge; comprising at least one agitator unit for agitating the digested sludge; and comprising a gas dome in which the biogas that has been produced can be collected and from which the biogas to be used further can be removed. According to the invention, such a digester unit is improved, with regard to cost-effective production and versatile usability, by said digester being designed in the form of a standard sea container.</p>
WO2013162889	Probst Group (US) et al.	<p>Anaerobic digester apparatus with a floating mixer integrated with a cover. An anaerobic digester apparatus including a container and an integrated cover and mixer system. The container includes vertical or sloped walls and is configured to contain wastewater and waste material. An integrated cover and mixer system is configured to extend over and cover the surface of the wastewater in the container. The cover is maintained on the surface of the wastewater in the container by a plurality of floats coupled to the cover. A mixer float is coupled to the cover with the mixer float including a mixer motor having a shaft extending through the mixer float and in fluid communication with the wastewater. The shaft includes an impeller configured to provide a downdraft mixing motion of the water and waste. The cover and mixer system are effectively integrated and coupled to the container to facilitate an anaerobic digestion of the waste in the container.</p>
WO2013162739	Univ Florida (US)	<p>System for anaerobic digestion of solid and soluble organic wastes, by-products and residues. The subject invention provides advantageous systems and processes for anaerobic digestion of organic waste streams, particularly agricultural waste streams. According to this invention, a new process is provided in which a liquid fraction from an organic waste stream comprising soluble compounds is segregated and incubated in a reactor separate from the solids fraction of the organic waste stream. Digestion of waste in both reactors occurs substantially simultaneously and both reactors produce biogas (thus both reactors function essentially like single stage reactors but allow for continuous or intermittent loading). According to one aspect of the invention, at least one cross-flow baffle is provided for use in an anaerobic digester to collect biogas and break up clumped solids in the reactor. In another aspect of the invention, packing media for use in an anaerobic digester is provided.</p>
WO2013156784	CPI Innovation Services Ltd (GB)	<p>Anaerobic digestor reactor and methods for the treatment of aqueous organic waste streams. An anaerobic digestor reactor for anaerobically digesting aqueous organic waste or by-product streams comprising soluble and insoluble solids comprising: an elongate reactor vessel having a feedstock inlet at one end and a digestate outlet at the opposite end and whose longitudinal axis is disposed, in use, generally horizontally; at least one baffle extending partially across the vessel intermediate its ends to define a weir for reaction mass flowing horizontally along the vessel thereby dividing the vessel into at least two reaction zones; and a recirculation system for extracting at least a portion of the reaction mass from the vessel and reintroducing at least a portion of the extracted reaction mass into the vessel. Also provided is method for anaerobically digesting aqueous organic waste or by-product streams.</p>
WO2013152771	C F Nielsen AS (DK)	<p>Method for processing a biomass containing lignocellulose. There is disclosed a method for processing a biomass (for example straw) containing lignocellulose such that cellulose and hemicellulose are made accessible for further processing, typically by decomposition, without needing energy-consuming dissolution of the biomass in water. The method includes repeated compressions of the biomass in a reciprocating piston press, where loose biomass is continuously fed into a piston chamber in front of a piston which moves the loose biomass into a tubular reaction chamber in which the biomass is compressed for producing a vapour explosion and autohydrolysis under simultaneous displacement of compressed biomass through the reaction chamber. After compression, the biomass can be added fluid livestock manure, fluid waster water sludge etc. in a biogas plant for a subsequent biogas process.</p>

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
EP2647614	Mezy Marcel Leon (FR)	<p>Method for preparing activated plant complexes and plant/organic matter complexes that are doped or overdoped, carbonated, and the uses thereof in particular in anaerobic digestion or biogas production. Preparing doped or overdoped plant complexes by covering a compost comprises: preparing 6-20, preferably 8-15 activated plant complexes (CV) by covering a layer of untreated straw with multiple smears of (6-20 or 8-15) plant complexes; mixing the dried CV material with 70-95 wt.% of carbonate including calcium carbonate to form a carbonate plant complex (CVC); performing aerobic fermentation of a plant compost, preparing a compost heap; collecting upper part of the compost located under the interface with the CVC layer; and sieving the final layer of 1 mm and overdoped plant complex. Preparing doped or overdoped plant complexes by covering a compost comprises: preparing 6-20, preferably 8-15 activated plant complexes (CV) by covering a layer of untreated straw with multiple smears of (6-20 or 8-15) plant complexes, where each one is obtained from a particular plant or plant material and the degradation of the products is above ground during 2-8 months, preferably 3-6 months or half buried in the ground for 18-24 months, preferably 2 years; drying the CV up to a concentration of 60-80% of solid materials; mixing the dried CV material with 70-95 wt.% of a carbonate including calcium carbonate to form a carbonate plant complex (CVC); performing, in parallel, aerobic fermentation of a plant compost containing 5-15% of organic matter during 3-6 days to produce a fermented compost fermentation (CP), preparing a compost heap CP by overlaying the CVC layer, preferably an upper layer of activated coarse material (GA) formed by the refusal of 1 mm sieve doped CVD plant complex obtained during a production of a lot or prior batch; collecting the upper part (d2) of the compost (CP) located under the interface with the CVC layer, where the GA layer is obtained, when it is no longer found to gassing top of the heap, without the CVD plant complex or with GA layer; and sieving the final layer of 1 mm and overdoped plant complex, by passing the sieve via pure or diluted minerals or organic minerals. Independent claims are included for: (1) doped (CVD) or overdoped (CVSD) plant complex products obtained by the method; (2) producing methane or methane-containing biogas, comprising introducing the digester into the at least one CVD or CVSD product; and (3) new industrial product including digestate and comprising double or triple of humic acids (140-200% higher).</p>
WO2013144825	Ambientalia S R L (IT)	<p>Unit for the digestion of organic wastes and plant for treating organic wastes comprising the unit. A unit for the digestion of mixtures of organic wastes and biomasses comprises a base, a member for containing a mass of organic wastes, rising from the base along a vertical axis of extension (A) and comprising at least one perimeter wall equipped, at its lower end adjacent to the base, with a reclosable mouth for picking up the mass. The containment member also comprises a roof having an openable door to allow organic wastes to be fed into the containment member. The unit also comprises means for feeding the organic wastes operatively associated with the door and configured to gravity feed the organic wastes into the containment member through said door and mixing means accommodated at least partly inside the containment member and configured to move the mass in order to distribute it.</p>
WO2013144703	Sereco Biotest SNC (IT)	<p>Apparatus for the production of biogas and related method. Apparatus for producing biogas by the anaerobic digestion of organic material (M), comprising at least one anaerobic reactor provided with a loading section for said organic material and a plurality of reaction chambers, arranged in line and connected one to each other by deflectors provided with lower and upper alternate passages, for the forced outflow of said organic material through each of said chambers of said plurality of reaction chambers, and means to convey the biogas produced within said one or more reaction chambers outside of said at least one reactor, characterized in that said at least one reactor comprises, as well, means (9) for the controlled recirculation of said organic material between one or more chambers of said plurality of reaction chambers.</p>

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013144817	Sita France (FR)	<p>Method for treating waste, in particular household refuse, and unit for implementing same. The invention relates to a method for treating waste, particularly household refuse, containing organic materials mixed with undesirable products, in particular metals, mineral materials, plastics, glass. According to the method, waste is subjected to a first screening process. The fraction of waste passing through the screening is subjected to a pre-fermentation treatment in a rotating tube and the material leaving the tube is subjected to a methanisation treatment in a digester. The waste, as collected and without preliminary shredding, is subjected to a first screening process using a screen of mesh size L1. Following said screening process, the fraction of waste is sent for treatment in the rotating tube. The rotating tube is supplied with waste regularly over time. The retention time of the waste in the rotating tube is substantially constant and at least equal to the time required for almost all of the organic material to be of a particle size fraction smaller than that of the undesirable products. Upon leaving the rotating tube, and before entering the digester, the waste is subjected to screening using a screen of mesh size L2, ensuring that the organic materials of a finer particle size are separated from the undesirable products.</p>
WO2013140416	Council Scient Ind Res (IN)	<p>An improved anaerobic digestion system for household organic wastes. The present invention provided a compact anaerobic digestion system to converts household waste biomass materials to methane rich biogas and concentrated compost slurry of about 9 to 40% solids for agriculture soil applications. The horizontal anaerobic digester vessel comprising a horizontal vessel provided with insulation and preferably cylindrical at the bottom, fitted inside of the said vessel is at least one shaft with 4-100 radial or horizontal or diagonal baffles at equal distribution, and attached with a handle or wheel outside the vessel to rotate the shaft from outside, the said vessel being provided with minimum of one port at one end for introducing the raw biomass wastes and another set of ports for discharging stabilized wastes at the opposite end, and having one valve-controlled gas port of above the level of the said port for discharging stabilized wastes, a small hand operated shredder coupled to the digester vessel for shredding/cutting/crushing large and hard solids such as bones to get particles preferably lesser than 10 mm sizes. The waste falls inside the digester and gets mixed slowly while being fed by rotating the handle attached to a shaft having baffles inside the digester.</p>
WO2013131876	Bekon Energy Technologies GmbH (DE)	<p>Bioreactor for methanizing biomass, biogas plant having a plurality of such bioreactors, and method for operating such a bioreactor. The invention relates to a bioreactor for methanizing biomass, a biogas plant having a plurality of such bioreactors, and a method for operating such a bioreactor. Because the elongated reactor vessel comprises a loading gate and an unloading gate, which are arranged at opposite ends of the elongated reactor vessel, it is possible to remove consumed biomass, which is harmless in terms of epidemiologic hygiene and plant hygiene due to thermophilic process control during the fermentation, from the reactor vessel through the unloading gate and to feed said consumed biomass directly to the composting process. The bioreactor thus has a "clean" unloading gate and an "unclean" loading gate.</p>
WO2013133703	Red Patent B V (NL)	<p>Biomass conversion methods and systems. The invention pertains to a process for converting biomass into biogas and renewable agricultural fertilizer, said process comprising anaerobic microbial digestion of biomass, producing a gaseous methane-comprising effluent, and an aqueous effluent comprising phosphorous-containing compounds, magnesium ions, ammonia, carbon dioxide and methane gas, subjecting said aqueous effluent in a struvite-forming step to low pressure, discharging a gaseous stream comprising carbon dioxide and methane gas from said struvite-forming step, thus forming struvite-solids, separating and collecting said struvite solids, to obtain an aqueous struvite-poor effluent, which struvite-poor effluent is subjected to aerobic microbial nitrification, thus converting ammonia into ammonium nitrate, therewith producing at least a first renewable agricultural fertilizer composition, and wherein said fertilizer composition is collected and transferred to storage. The invention also pertains to a system for performing the above process.</p>

DIGESTIÓN ANAERÓDICA		
Nº Publicación	Solicitante (País)	Contenido técnico
WO2013126977	Meta Consultoria Paticipacoes e Servicos LTDA G (BR)	<p>Anaerobic process for producing biogas with a high methane content by means of the biodigestion of organic waste. The invention relates to a process for increased production of biogas with a high methane content in anaerobic biodigestion plants, with production of electricity and heat. The process is based on the use of biotechnologies, hardware and software specifically developed for this purpose. One or more devices for accelerating the multiplication of autochthonous methane-producing bacteria already present in the organic waste withdraw a portion of biological material from the anaerobic biodigester and successively return same, potentiated, with the methane-producing bacterial population thereof considerably multiplied. The increase in and stabilization of the reproduction and nutrition of these bacterial phyla promotes the increase in the quantity of biogas produced in the anaerobic biodigester and the percentage of methane contained in said biogas. The process is managed by an expert automation system that controls biological, chemical and physical variables and supervises the automation and control system of the plant, generating commands and formulae, also, for the systems for producing compost and the sludge-separation and water-treatment station.</p>
WO2013131627	Niederbacher Michael (IT)	<p>Biogas plant fermentation tank having a service device, and service device. The invention relates to a biogas plant fermentation tank having a service device, provided with a service opening on the ceiling side that can be locked, preferably in a gas-tight manner, using an covering device. The service opening makes it possible to access an immersion apparatus, in particular a submersible stirrer or an immersion pump, which is guided on a height-adjustable guide mast for maintenance and service work. According to the invention, the guide mast is rotatably and/or pivotably mounted at a bearing location of the service device by way of a bearing shaft, wherein the bearing shaft, in order to rotate or pivot the guide mast, is coupled by means of a guide mast pivoting device arranged outside the fermentation tank. The immersion apparatus is coupled to an immersion apparatus height adjustment device arranged outside the fermentation tank, which is provided with a drive shaft, which, together with the bearing shaft of the guide mast pivoting device, is guided in a hollow shaft arrangement through the bearing surface of the service device into the inner chamber of the fermentation tank. The drive shaft in the inner chamber of the fermentation tank interacts, directly or indirectly, with an adjustment element, by means of which the height of the immersion apparatus on the guide mast can be adjusted.</p>
EP2634257	Kompoferm GmbH (DE)	<p>Fermentation method for biomass. Fermenting solid, stackable biomass in a fermenter, comprises introducing the solid, stackable biomass into the fermenter, and fermenting in an anaerobic fermentation phase after a starting phase for producing methane containing biogas. The volume of the fermenter, preferably the volume of the head space of the fermenter is reduced during the transition of the starting phase in the fermentation phase before switching of gas stream discharged from the fermenter from the inlet of an exhaust system to the inlet of a biogas utilization system. Fermenting solid, stackable biomass in a fermenter, comprises introducing the solid, stackable biomass into the fermenter, and fermenting in an anaerobic fermentation phase after a starting phase for producing methane containing biogas, where a shut-down phase is carried out after the fermentation phase, and a gas stream is discharged from the fermenter. The volume of the fermenter, preferably the volume of the head space of the fermenter is reduced during the transition of the starting phase in the fermentation phase before switching of gas stream discharged from the fermenter from the inlet of an exhaust system to the inlet of a biogas utilization system, and/or during the transition of the fermentation in the shut-down phase before switching of gas stream discharged from the fermenter from the inlet of a biogas utilization system to the inlet of a lean-gas system or an exhaust system.</p>

DIGESTIÓN ANAERÓBICA

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013119072	SK Chemicals CO Ltd (KR)	<p>Microorganism cultivator for inducing activation of anaerobic digestion of organic waste. The present invention relates to a microorganism cultivator for inducing the activation of anaerobic digestion of organic waste and, more particularly, to a microorganism cultivator for inducing the activation of anaerobic digestion of organic waste wherein methane fermented microorganisms are activated in a culture solution containing organic contaminants. To this end, the present invention comprises: a hollow culture container having a culture solution supplying tube through which a culture solution enters from the outside; hollow first and second gas supply heads disposed vertically apart at a central portion within the culture container, and receiving carbon dioxide gas from a gas supply fan; a plurality of first spray nozzles connected and installed on the outer peripheral surface of the first gas supply head, and disposed at a certain angle downward toward the inner wall surface of the culture container; and a plurality of second spray nozzles connected and installed on the outer peripheral surface of the second gas supply head, and disposed at a certain angle upward toward the central portion of the culture container, wherein the gas from the first spray nozzles is sprayed downward toward the inner wall surface of the culture container, the gas from the second spray nozzles is sprayed upward toward the central portion of the culture container, and the gas is sprayed on the culture solution while the culture solution is stirred.</p>
WO2013114001	Maaseudun Voima OY (FI)	<p>Method and system for producing biogas. A system for producing biogas from waste stream comprising organic material comprises a liquid waste container and a solid waste container. In addition it comprises a separator for at least partially separating liquid fraction into the liquid waste container and solid fraction into the solid waste container from the waste stream so that said solid waste container comprises more solid content than the liquid waste container. Furthermore the system comprises a communication means between the liquid waste container and a mixer for introducing liquid from the liquid waste container to the waste stream portion comprising solid fraction in order to extract more liquid from said solid fraction.</p>
EP2614890	RE N Technology APS (DK)	<p>A method for operating a biogas plant. The invention relates to a method for operating a biogas plant, which method comprises the steps of fractionating an organic waste material into a solid and a liquid fraction, leading the solid fraction to a biogas reactor, removing ammonium nitrogen from the liquid fraction, and leading a portion of the liquid fraction, from which nitrogen has been removed, to the biogas reactor.</p>

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013175074	ROAL OY (FI)	Improved endoglucanases for treatment of cellulosic material. The present invention relates to production of fermentable sugars from lignocellulosic material by enzymatic conversion. The fermentable sugars are useful e.g. in the production of bioethanol. Novel polypeptides having endoglu-canase activity, polynucleotides encoding them and vectors and host cells containing the polynucleotides are disclosed. A method for treating cellulosic material with the novel endoglucanase as well as uses of the enzymes and enzyme preparations and a method of preparing them are described.
WO2013177466	Anzatech New Zealand Ltd (NZ) et al.	A fermentation and simulated moving bed process. The invention provides an improved method for the production, separation and recovery of one or more fermentation products from a fermentation broth. Further, the invention provides a method for increasing efficiency of a fermentation reaction. In particular, the invention relates to a fermentation system which incorporates a simulated moving bed for separation of fermentation products from a fermentation broth, and a corresponding method.
WO2013172628	GS Caltex Corp (KR)	Method for producing bioproducts using hydrolyzed fermented organic wastes. The present invention relates to a method for producing bioproducts, comprising the steps of: culturing a first microorganism to produce bioalcohol; hydrolyzing the first microorganism; separating the bioalcohol; acquiring waste from the hydrolyzed bioalcohol fermentation; and inoculating the wastes from the hydrolyzed bioalcohol fermentation with a second microorganism.
WO2013170034	Abengoa Bioenergy New Technologies LLC (US)	High efficiency ethanol process and high protein feed co-product. A process for obtaining high ethanol yield from the fermentation of an energy crop and for producing a nutritionally enhanced feed co-product is provided. In particular, the process includes converting non-fermentable polysaccharides in an energy crop into fermentable sugar. The fermentable sugars may be fermented into ethanol thereby enhancing the ethanol yield. In addition, separation of ethanol from the fermentation product yields a whole stillage product having enhanced protein content and reduced fiber content. The process requires little or no modification to the configuration of existing commercial ethanol facilities.
WO2013163703	Petroleo Brasileiro SA (BR) et al.	Integrated process for producing enzyme formulations from agro-industrial waste and biofuel production. The invention relates to the production and use of enzyme formulations, and is aimed at the hydrolysis of starch granules from agro-industrial waste. These formulations are obtained by an economical process and after being produced are used for co-processing raw materials having different compositions for converting biomass having a high starch content and also lignocellulose-containing biomass into sugar-rich streams, it being possible to ferment said biomass subsequently in order to produce biofuels, in particular ethanol, and "green" chemical products, such as organic acids, biopolymers, antibiotics and polyols. The process for producing these formulations is conducted in an integrated manner, with the objective of decreasing the energy-related costs involved in such processes.
WO2013165962	P Corp North America INC (US)	Lignocellulosic conversion process with tissue separation. Methods of producing renewable materials, such as biofuels, may include separating lignocellulosic feedstock into various fractions, pretreating at least one of the fractions, and further treating the pretreated fraction(s) to produce a renewable material. More particularly, an outer-most stalk tissue, or rind, of the lignocellulosic feedstock having the least-accessible carbohydrates can be separated from the leaves and pith of the feedstock. Then the easily-accessible leaves, pith, and sugars can be processed together, while the rind can either be processed separately to produce a renewable material, or turned into other products. In certain embodiments, a cane tissue fractionation system is included at a front end of a sugar mill.

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Nº Publicación	Solicitante (País)	Contenido técnico
WO2013166312	Univ Columbia (US)	Biofuel production enzymes and uses thereof. The invention discloses enzymes for use in biofuel production. Some aspects of the present invention provide for ancestral fungal cellulases. Cellulase enzymes are useful for the production of cellulosic ethanol for biofuels. In some embodiments, ancestral cellulases can be used for the hydrolysis of carbohydrate polymers that comprise cellulose. Some aspects of the present invention provide for microorganisms that express an ancestral cellulase. Microorganisms are useful for the production of cellulosic ethanol for biofuels. In some embodiments, microorganisms can be used for the hydrolysis and/or fermentation of cellulose.
WO2013166405	Archer Daniels Midland CO (US)	Cellulolytic enzyme enhancement of dry grind corn processing and ethanol production. A method to increase ethanol production from a corn dry-mill process is described that comprises adding an enzyme preparation derived from <i>Trichoderma reesei</i> having cellulolytic activity to a saccharification process that includes conventional alpha amylase and glucoamylase. The addition of the cellulolytic enzyme decreases viscosity of the saccharified mash and can increase ethanol yield from a dry grind fermentation by as much as 10% or more. Specific characteristics are provided to show surprising and advantageous results of one particular preparation of cellulolytic enzymes from <i>T. reesei</i> .
WO2013166458	Butamax TM Advanced Biofuels (US)	Processes and systems for alcohol production and recovery. The present invention relates to processes for recovering butanol produced in a fermentative process using, for example, an ethanol production plant which has been reversibly retrofitted for butanol production, that is, the ethanol production plant may be converted for butanol production, but can also revert to an ethanol production. The present invention also relates to processes for recovering butanol produced in a fermentative process in a butanol production plant that may be converted to ethanol production plant.
WO2013156642	Merino Febrero Vicente (ES) et al.	Method for producing bioethanol in a multifunctional biorefinery. The present invention relates to a method for producing sugar and/or bioethanol from biomass which includes: (a) a main method for producing bioethanol and/or sugar; (b) a secondary method for producing biofuels and/or chemical products from bioethanol and/or the by-products of the production of bioethanol; wherein the main method for producing bioethanol in turn includes:(c) obtaining a diffusion juice from the biomass used as a raw material, said diffusion juice being separated from a residue or pulps; and (d) subjecting the diffusion juice obtained in the preceding step to a process of alcoholic fermentation and subsequent distillation and dehydration.
WO2013163571	Michigan Biotechnology Inst D B A MBI (US)	Methods of hydrolyzing pretreated densified biomass particulates and systems related thereto. A method is provided in which pretreated and densified cellulosic biomass particulates can hydrolyzed at a high solids loading rate as compared with the solids loading rate of loose hydrolysable cellulosic biomass fibers. The resulting high concentration sugar-containing stream can be easily converted to biofuels or an entire suite of other useful bioproducts.
WO2013142934	TC CT de Tecnologia Canavieira SA (BR)	System and method for the integrated production of first- and second-generation ethanol and the use of integration points for said production. The present invention relates to a system and to a method for the production of ethanol and similar products from lignocellulosic biomasses (second-generation (2G) ethanol), especially bagasse and sugar-cane stalks - although not limited thereto - integrated into conventional methods for producing ethanol (first-generation (1G) ethanol) such as, for example, using cane juice and/or molasses (a typically Brazilian method, either in sugar and ethanol plants or stand-alone distilleries), corn, cereal, wheat, saccharine sorghum, white beet, inter alia, comprising reutilization of flows and effluents. More specifically, the present invention relates to an integrated method for production of ethanol and similar products with enhanced efficiency in terms of use of the raw material, steam, electrical energy and treated water, in the main.

FERMENTACIÓN

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013146540	Kansai Chem Eng (JP)	Method for producing ethanol. Provided is a method for producing ethanol from a lignocellulose biomass at low cost using yeast. The method for producing ethanol from a lignocellulose biomass according to the present invention comprises (1) a step of pretreating the lignocellulose biomass, (2) a step of treating a cellulose fraction obtained in step (1) with a cellulose hydrolase, (3) a step of mixing a glycosylated biomass obtained in step (2) with yeast to perform ethanol fermentation, and (4) a step of separating a fermentation product obtained in step (3) into a solid material and a liquid material, wherein a cycle comprising the above-mentioned steps (1), (2), (3) and (4) is repeated at least two times and yeast obtained in step (4) is used as the whole or a portion of the yeast to be used in step (3) in the next cycle.
WO2013142968	Univ Toronto (CA)	Compositions, methods, and plant genes for the improved production of fermentable sugars for biofuel production. Described herein are compositions comprising at least one auxin transport inhibitor for pre-treating a plant or seed to increase saccharification, or saccharide release by hydrolysis, the at least one auxin transport inhibitor being in an amount effective to increase sugar release from a plant tissue by hydrolysis. Also described are plant mutations, and methods to screen for such plant mutations, having an improved sugar release phenotype. The described compositions, methods and plant mutations are particularly useful for producing biofuel crops, such as maize, to improve sugar extractability from lignocellulosic biomass and hence, the efficiency of bioethanol production overall.
WO2013141905	Mascoma Corp (US)	Engineering an increase in ethanol production by altering cofactor specificity. The present invention provides for the manipulation of cofactor usage in a recombinant host cell to increase the formation of desirable products. In some embodiments, the invention provides for a recombinant microorganism comprising a mutation in one or more native enzymes such that their cofactor specificity is altered in such a way that overall cofactor usage in the cell is balanced for a specified pathway and there is an increase in a specific product formation within the cell. In some embodiments, endogenous enzymes are replaced by enzymes with an alternate cofactor specificity from a different species.
WO2013131162	Companhia Paulista de Forca e Luz CPFL (BR) et al.	Method for producing bioethanol from banana pseudostem by enzymatic hydrolysis, and use of the same. The present invention relates to a method for producing bioethanol from banana pseudostem by enzymatic hydrolysis, using a pre-treatment with sodium hydroxide pure or in combination with sodium hypochlorite, acetic acid and/or vinegar in combination with hydrogen peroxide, sulphuric acid, the combination of sodium hydroxide and sulphuric acid, the combination of vapour explosion and sodium hydroxide, followed by enzymatic hydrolysis of the biomass pre-treated with the NS 22074 and NS 50012 cellulase enzymes in an ultra-sound bath or shaker-type bath, the best result being obtained by enzymatic hydrolysis of the biomass in a shaker for 48 hours, with 3% sodium hydroxide (0.2 g), a mixture of the NS 22074 enzyme (0.015 mL) and NS 50012 enzyme (0.015 mL), since only 1.2 kg of pre-treated biomass and only 180 mL of the mixture of the NS 22074 and NS 50012 enzymes are required to produce 1 kg of fermentable sugars, thus proving to be an economically viable method for producing bioethanol.
WO2013122917	BP Corp North America INC (US) et al.	Methods for detoxifying a lignocellulosic hydrolysate. The present disclosure relates to methods for detoxifying a hydrolysate obtained from a lignocellulosic biomass and methods of producing ethanol from the detoxified hydrolysate. The present methods provide detoxified hydrolysates in which the quantity of compounds that are deleterious to fermenting microorganisms are substantially reduced relative to the starting hydrolysate and in which the amount of fermentable sugars loss is minimal.
WO2013114962	Sapporo Breweries (JP)	Bioethanol production method and production system. The present invention provides a bioethanol production method comprising the following: a hydration step in which the ground product of cassava residue and water are mixed while being heated and pressurized causing the ground product to be hydrated; an enzyme addition step in which cellulase and glycoamylase are added as hydrolyses to the hydrated ground product in order to obtain a fermentation starting material; and a fermentation step in which a fermented mash is obtained from the fermentation starting material by ethanol fermentation using an ethanol fermentative bacteria.

TECNOLOGÍAS QUÍMICAS

Patentes

Nº Publicación	Solicitante (País)	Contenido técnico
WO2013165217	Korea Res Inst of Bioscience (KR)	Method for producing biodiesel using microorganisms without drying process. The present invention relates to a method for producing biodiesel without a drying process or lipid component extraction process in an environment predominantly containing alcohol. The present invention provides a method for producing biodiesel, in which the method may establish an optimum condition for transesterification to thus produce biodiesel in an effective manner even without a catalyst, thus reducing the number of processes, the production cost and time while increasing the yield rate of bio-diesels.
WO2013156635	Repsol YPF SA (ES) et al.	Microorganism of the genus tetraselmis and the use thereof for the production of biofuels. The present invention relates to a microorganism belonging to the Tetraselmis suecica microalgae species with Spanish Algae Bank access number BEA D01_11. Furthermore, the present invention relates to the use of this strain for the production of biofuels and also to the method for producing said biofuels.
WO2013156953	Nis Biotech LLC (US) et al.	Process for obtaining biofuel from castor oil. A process for obtaining turbo biofuel from castor oil wherein the oil, methanol and sodium hydroxide previously diluted in said methanol, are reacted by transesterification at a temperature less than 40 DEG C and for a maximum time of 60 minutes; it is decanted; formed glycerin, is removed; it is neutralized with acid; it is washed with water in at least two steps; the aqueous phase from the last washing is removed to obtain raw biodiesel; the remaining water and methanol are eliminated by vacuum distillation and raw, dry biodiesel is obtained, which is diluted with JP A1 turbo fuel at a concentration of biodiesel of between 5 and 30% w/w, a 50% mixture of C1-C3 light alcohol with water is added; this mixture is kept at -29 DEG C for 12 hours; it is centrifuged; it is filtered through a filter of 20 microns; it is filtered through a filter of 1 micron.
WO2013156872	Narine Suresh (CA) et al.	Phase behaviors and properties of certain triacylglycerols and fatty acid methyl esters. This application relates to phase behaviors of certain triacylglycerols and fatty acid methyl esters, and how the phase behaviors 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.
WO2013140842	Yanmar CO Ltd (JP)	Heterogeneous catalyst for producing biodiesel. Provided is a heterogeneous catalyst used for the production of biodiesel, as a catalyst capable of being used in conventional production methods for Fatty Acid Methyl Esters (FAME). The heterogeneous catalyst has zeolite particles having a particle size of 0.25-0.50 mm, and the zeolite particles exchange ions, with 5MNaOCH3. During the ion exchange, the zeolite:NaOCH3 ratio is 1:2; the zeolite and NaOCH3 mixture is agitated for 1 hour at 50 DEG -60 DEG C; this agitation is repeated at least 3 times; and the zeolite particles are dried for 2 hours at 110 DEG -150 DEG C.
WO2013133526	Korea Res Inst of Bioscience (KR)	Novel microorganism of rhizobiales sp. kb 10 having properties of stimulating growth and increasing fatty acid content of botryococcus braunii. The present invention relates to a Rhizobiales sp. KB 10 strain having the functions of simultaneously stimulating the growth of Botryococcus braunii, which is a biodiesel-producing alga, and enhancing the ability thereof to produce biodiesel, and more particularly, to a Rhizobiales sp. KB 10 strain, a novel strain, having the functions of stimulating the growth of Botryococcus braunii, which is used for producing biodiesel, and maximally increasing C18 oleic acid content by up to 9 times more, which corresponds to a high-quality biodiesel component. By using leguminous bacteria such as Rhizobiales, the poor cell growth of Botryococcus braunii can be effectively stimulated while simultaneously maximally increasing oleic acid content, which is a high-quality biodiesel component. Also, the problem of contamination caused by other microorganisms during an open culture process for producing biodiesel can be readily solved by using a mixed culture of the bacteria.
WO2013138788	Mowry Gregory (US)	Biodiesel production. A reactor includes a shell having an input port configured to receive a reaction mixture and an output port configured to discharge a reaction product and a plug within the shell, the sintered plug having a first catalyst configured to transform the reaction mixture into the reaction product, the plug having pores of at least 0.01 micrometers ([μm]) diameter. A conduit includes a first and second lumen, the first lumen configured to carry a first fluid in a first direction and the second lumen configured to carry a second fluid in a second direction, the first lumen helically twisted relative to the second lumen, and the first lumen configured to conductively transfer thermal energy to the second lumen. A system includes a reactor with a sintered plug and a heat exchanger including a first and a second lumen helically intertwined about an axis.

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WO2013123288	Baker Hughes Inc (US)	Biofuel having improved cold flow properties. A biodiesel may be prepared using an admixture of petroleum diesel and an algal derived hydrotreated renewable diesel which can be treated with petroleum diesel cold flow additives. The resulting diesel fuel may be employed even in cold climates despite the high paraffin content and high degree of saturation of the hydrotreated renewable diesel component of the fuel.
WO2013120985	Total Raffinage Marketing (FR)	Additives for improving the resistance to wear and to lacquering of diesel or biodiesel fuels. The present invention relates to novel wear-resistance additives for diesel or biodiesel fuels having a sulphur content of less than or equal to 500 ppm by weight. These novel additives also improve the resistance to lacquering of higher quality diesel or biodiesel fuels having a sulphur content of less than or equal to 500 ppm by weight.
EP2623585	Maria Aparecida Cirone taboada ME (BR)	Process for producing high-yield biodiesel applying high acidity triglycerides with generation of glycerin 90% free of salts. Process for producing high-yield biodiesel applying high acidity triglycerides with generation of glycerin 90% free of salts starting from fatty lower cost fatty material allied with an esterification and innovative extraction process that generates a further value, more specifically for the production of biodiesel.
WO2013116342	Revolution Fuels Inc (US)	Mobile processing systems and methods for producing biodiesel fuel from waste oils. The present invention improves biodiesel production in several ways. Unique combinations of unit operations and flow configurations are disclosed in mobile processing units that are feedstock-flexible and can be dynamically deployed in a distributed way. In some embodiments, a process includes introducing a waste oil and an alcohol into a reactor with an esterification-transesterification enzymatic catalyst. Free fatty acids are reacted with alcohol to produce fatty acid alkyl esters, and glycerides are reacted with alcohol to produce fatty acid alkyl esters and glycerin. A membrane separator removes glycerin, water, and alcohol. Unreacted free fatty acids are then separated and recycled, to generate a product stream with fatty acid alkyl esters. A genset may be provided for combusting glycerin to produce electrical power and thermal heat as co-products.; This biodiesel process may be energy self-sufficient, require no external utilities, and avoid direct discharge of wastewater.
WO2013093836	CO MA SE S R L (IT)	Process for the production of bioliquid or biofuel. A process for the production of a bioliquid or biofuel, the process comprising the following operations: i) providing a biomass of fungi, preferably yeasts, either deactivated or inactive; ii) subjecting the biomass to mechanical liquefaction to obtain a solid phase and a first gas phase; iii) subjecting the first gas phase to condensation to obtain the bioliquid or biofuel and a second gas phase; and iv) subjecting the bioliquid or biofuel to at least one process of upgrading to obtain at least one from among: elimination of solid residue, improvement of the pH, deoxygenation, increase of calorific power, and decrease of viscosity, to obtain at the end the industrially usable bioliquid or biofuel.
ES2393352	Univ Salamanca (ES)	Derivados de acido sulfónico para síntesis de biodiesel. Derivados de ácido sulfónico de fórmula I, donde Cy1 es un grupo aromático. Estos compuestos son útiles como catalizadores en reacciones orgánicas, particularmente en reacciones de síntesis de biodísel.
WO2013091002	Biocube Corp Ltd (AU) et al.	A biodiesel manufacturing system and apparatus. A biodiesel manufacturing or processing plant for processing on continuous basis a process fluid from a raw oil feedstock, the plant including a housing containing a power generation means, an inlet for raw oil from an oil bearing crop, a raw oil heating vessel, an esterification subprocess including a reactor in which the process fluid is reacted with alcohol via selective esterification by a catalyst, a trans-esterification subprocess including an alkali dosing mechanism to dose the process fluid in the presence of an alcohol, a powered sheer mixer to mix the alkali, alcohol and process fluid, and a heated cauldron for primary separation of glycerol from the process fluid, a chantrelle for separation of excess alcohol from the process fluid through a differential pressure vaporisation process, and one or more finishing processes.



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