



New connection on: : 05-07-2018 : 06:38:01 - Last disconnection on: : 04-07-2018 : 22:34:49

V 4.0.0.44358(LP,U,linux) (Rev:43856 2017-04-27 09:03:29 +0200#(D201802)) (RPM D201802)

Welcome to EPOQUE Rebuild under the Production Environment

[No database/cluster active] ..fi epodoc

 Database: EPODOC

[EPODOC: SS 1] bio_diesel or bio_fuel

Results in EPODOC 11.421

[SS 2] * and (method or process)

Results in EPODOC 7.488

[SS 3] * and (wash+ 3d water)

Results in EPODOC 159

[SS 4] * and purificitat*

Results in EPODOC 0

EPODOC: term 'PURIFICITAT*' not found in index 'BI'. WARNING(1)

[SS 5] 3 and purificitat+

Results in EPODOC 0

EPODOC: No term found in index 'BI' for the truncation 'PURIFICITAT+'. WARNING(401)

[SS 6] 3 and purificat+

Results in EPODOC 17

[SS 7] * and PD<2014-12-17

Results in EPODOC 14

[SS 8] ..li

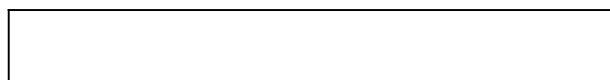


1/14 © EPODOC / EPO

- PN - [JP2014122317](#) A 20140703
- PR - JP20120280375 20121223
- AP - JP20120280375 20121223
- DT - I
- CCA - [Y02E50/13](#)
- FI - C10L1/02; C11B3/10; C11C3/10
- FT - 4H013/BA02; 4H059/AA03; 4H059/AA13; 4H059/BA12; 4H059/BA30; 4H059/BC13; 4H059/CA02; 4H059/CA21; 4H059/CA36; 4H059/CA94; 4H059/CA96; 4H059/EA17
- PA - UNIV CHUBE
- TI - **BIODIESEL FUEL PRODUCTION SYSTEM AND BIODIESEL FUEL PRODUCTION METHOD**
- AB - PROBLEM TO BE SOLVED: To provide a **biodiesel** fuel production system and a **biodiesel** fuel production **method** capable of carrying out efficient **purification** with a simple apparatus configuration without the need of **washing by water** in the **purification** of crude **biodiesel** fuel. SOLUTION: A **biodiesel** fuel production system 1 includes: a raw material tank 10; a transesterification apparatus 20; an aeration apparatus 30 to remove alcohol; and an impurity removal apparatus 40 to remove impurity from crude **biodiesel** fuel with the alcohol removed. The aeration apparatus 30 includes: an aeration tank 31 that is configured to be able to pool crude **biodiesel** fuel and heat it to a predetermined temperature, and carries out the aeration by gas; a gas supply unit 32 to supply gas to crude **biodiesel** fuel; an aeration unit 33 that is connected to the gas supply unit 32 and provides aeration to crude **biodiesel** fuel; and a cooling tower 34 to cool the gas after aeration and recover alcohol.

2/14 © EPODOC / EPO

- PN - [TW201239079](#) A 20121001
- PR - TW20110111178 20110331
- AP - TW20110111178 20110331
- DT - I
- CCA - [Y02E50/13](#) ; [Y02P30/20](#)
- PA - RESI CORP [TW]; CHANG RON-HSIN [TW]
- TI - High temperature multistage continuous recycle **process** for the production of **biodiesel**
- AB - This invention is a high temperature continuous recycle **process** for the production of **biodiesel**. Accordingly, one aspect of the present invention provides an integrated continuous **process**



with acid catalyst and base catalyst for the esterification and trans-esterification of triglycerides and low carbon alkyl alcohol, respectively, in a series of oscillatory continuous flow reactors with recycle, operating at a temperature slightly lower than boiling point of the said low carbon alkyl alcohol. The reactions will be carried out in a series of oscillatory continuous flow reactors with recycle to produce **biodiesel** and glycerin. Glycerin and alcohol mixtures separated, by using mechanical separators, from the product streams of the first and the second reactors will be mixed, neutralized, and purified, by a glycerin **purification process**, to produce glycerin product. The low carbon alkyl alcohol and glycerin mixture produced from the third reactor will be pumped to the second reactor for further reaction. The **biodiesel** produced from the third reactor will be **washed**, by using pure **water**, and be purified by a **biodiesel purification process** to produce **biodiesel** product. The solution of low carbon alkyl alcohol and catalyst, generated from the **biodiesel purification process** and glycerin **purification process**, will be concentrated and recycled for **process** utilization by using a low carbon alkyl alcohol **purification process**.

3/14 © EPODOC / EPO

PN - [TW201226550](#) A 20120701

PNFP - TWI422674B B 20140111

PR - TW20100144548 20101217

AP - TW20100144548 20101217

DT - I



CCA	- Y02E50/13 ; Y02P30/20
PA	- (A B) NAT TAICHUNG UNIVERSITY OF EDUCATION [TW]
TI	- (A B) Method of calcium carbide residue as a low-cost solid catalyst for biodiesel production
AB	- (A) The method of calcium carbide residue as a low-cost solid catalyst for biodiesel production of the present invention includes: Step1: Preparation of the solid catalyst: The product of the reaction is obtained from hydrolyzing the calcium carbide. After drying the product, we will get the solid calcium oxide. Step2: Transesterification: Mix triacylglycerol with alcohol. Boil the said mixture (some vaporizing mixture return back from the cool down system). And then add the said solid calcium oxide as a catalyst into a reaction container with said mixture, whereby getting fatty acid methyl ester and glycerol. Step3: Separation and purification : The mixtures comprise fatty acid methyl ester, glycerol and solid calcium oxide. Standing the reaction container for a period of time. The mixtures will separate into three layers. Suck out these layers in order. The fatty acid methyl ester is used for biodiesel which is a kind of fuel. Boiling and sucking out the remaining methanol and water of the fatty acid methyl ester, after washing it by pure water several times. Whereby the method can enhance the rate of the transesterification reaction.

4/14 © EPODOC / EPO

- PN - [TW201226549](#) A 20120701
- PNFP - TWI422673B B 20140111
- PR - TW20100144546 20101217
- AP - TW20100144546 20101217
- DT - I
- CCA - [Y02E50/13](#) ; [Y02P30/20](#)
- PA - (A B)
NAT TAICHUNG UNIVERSITY OF EDUCATION [TW]
- TI - (A)
Method of waste concrete as a low-cost solid catalyst for **biodiesel** production
- (B)
Method of waste concrete as a low-cost solid catalyst for **biodiesel** production
- AB - (A)
The **method** of waste concrete as a low-cost solid catalyst for **biodiesel** production of the present invention includes: Step1: Preparation of the solid catalyst: Grind the waste concrete into powder. The catalyst is obtained from burning the powder under the condition of a calcination temperature. Step2: Transesterification: Mix triacylglycerol with alcohol. Boil the said mixture (some vaporizing mixture return back from the cool down system). And then add the said solid calcium oxide as a catalyst into a reaction container with said mixture, whereby getting fatty acid methyl ester and glycerol. Step3: Separation and **purification**: The mixtures comprise fatty acid methyl ester, glycerol and solid calcium oxide. Standing the reaction container for a period of time. The mixtures will separate into three layers. Suck out these layers in order. The fatty acid methyl ester is used for **biodiesel** which is a kind of fuel. Boiling and sucking out the remaining methanol and water of the fatty acid methyl ester, after **washing** it by pure **water** several times. Whereby the **method** can enhance the rate of the transesterification reaction.

5/14 © EPODOC / EPO

- PN - [CN102397777](#) A 20120404
- PNFP - CN102397777B B 20130508
- PR - CN20111304538 20110929
- AP - CN20111304538 20110929
- DT - I
- CT - || STSE (A)
[CN101457176](#) A 20090617 [A] (ROHM & HAAS [US])
[A] 1-5
具体实施方式
[CN101475824](#) A 20090708 [A] (LI WANG [CN])
[A] 1-5
说明书第3页第2段至第9页第5段
[XP028327749](#) A 00000000 [Y]
- CTNP - || STSE (A)
[] <<Journal of the American Oil Chemists' Society>> 20001231

Adam Farook, et al. Saturated fatty acid adsorption by acidified rice hull ash 第437-440页 1-5
第77卷, 第4期

[Y] M.C. Manique, et al., "Rice husk ash as an adsorbent for purifying biodiesel from waste frying oil", <<Fuel>>, (20110730), vol. 92, doi:doi:[10.1016/j.fuel.2011.07.024](https://doi.org/10.1016/j.fuel.2011.07.024),
PAGE 56 - 61, XP028327749

[Y]

1-5

第56-61页

[YX] Adam Farook, et al., "Saturated fatty acid adsorption by acidified rice hull ash", <<Journal of the American Oil Chemists' Society>>, (20001231), vol. 77, no. 4, PAGE 437 - 440

[Y] 1-5

第437-440页

[X] 1-5

CCA

- [Y02E50/13](#)

PA

- (A)

ZHONGXING ENERGY HUBEI CO LTD

- (B)

ZTE ENERGY HUBEI CO LTD

TI

- (A B)

Preparation **method** of activated rice husk ash and application of activated rice husk ash to **purification** of **biodiesel**

AB

- (A)

The invention discloses a preparation **method** of activated rice husk ash. The **method** comprises the following steps: 1) hydrochloric acid immersion: immersing the rice husk ash with 3mol/L hydrochloric acid for 2-6 h; 2) washing and draining: washing to neutral and draining; 3) high temperature treatment: sintering at 500-600 DEG C for 2-8 h to obtain the activated rice husk ash. The **method** of the invention is simple, and prepared activated rice husk ash has large specific surface area, strong adsorption capability and low cost. The invention also discloses application of the prepared activatedrice husk ash to **purification** of **biodiesel**. Applied to **purification** of **biodiesel**, the activated rice husk ash has advantages of simple equipment, easy operation, zero **washing**, waste **water** discharge reduction and environmental pollution reduction.

6/14 © EPODOC / EPO

PN

- [US2011166378](#) A1 20110707

PNFP

- US8269028 B2 20120918

PR

- US201113032980 20110223; US20090409250 20090323; US20040547574 20040317; WO2004US08294 20040317; US20030456097P 20030320

AP

- US201113032980 20110223

DT

- **

CT

- || R141 (A1)
[US6015440](#) A [];

	US5399731 A [US7507846 B2 [US7906082 B2 [US5514820 A [US5424467 A [US6262285 B1 [US6440057 B1 [US3474131 A [US5972057 A [US6127560 A [US5468887 A [US3927982 A [
CCI	- C07C67/03 ; C07C67/08 ; C10L1/026 ; C11C1/08 ; C11C3/003 ; C11C3/10
CLC	- C07C67/03 , C07C69/24 , INV - C07C67/03 , C07C69/52 , INV - C07C67/08 , C07C69/24 , INV - C07C67/08 , C07C69/52 , INV
CCA	- Y02E50/13 ; Y02P30/20 ; Y02P20/582
PA	- (B2) PELLEY MICHAEL F [US]
TI	- (A1 B2) METHOD AND APPARATUS FOR REFINING BIODIESEL
AB	- (A1 B2) Method and apparatus for producing biodiesel fuel, i.e., alkyl ester, from vegetable and/or animal oil. A transesterification catalyst is prepared in a base catalyst tank by spraying alkyl alcohol under pressure through jets at metal hydroxide pellets until the pellets have fully reacted with the alcohol. The oil is heated and transesterified in the presence of alkyl alcohol and the transesterification catalyst in a closed, recirculating transesterification flow system under slight cavitation to yield product alkyl ester and product glycerol. Cavitation is achieved by permitting air to enter the transesterification flow system through an adjustable air inlet valve. When permitted to stand, product alkyl ester forms an upper layer that is decanted and subjected to purification steps, to remove particulates and alkyl alcohol from the product alkyl ester, and a lower layer of product glycerol is drained away. Purification of the product alkyl ester preferably includes subjecting the product alkyl ester to an overhead water mist in a wash tank with simultaneous infusion of a stream of air bubbles. Alcohol vapor is reclaimed as liquid alcohol within an alcohol condenser and stored for reuse. If the oil contains free fatty acids, prior to transesterification, the oil is heated and the free fatty acids are esterified in the presence of an esterification catalyst and alkyl alcohol. For safety, baffles and explosion damper/flame arrestors are provided in locations where flammable vapors pose a risk.
7/14	© EPODOC / EPO
PN	- US2010015020 A1 20100121
PNFP	- US7906082 B2 20110315
PR	- US20090409250 20090323; US20040547574 20040317; WO2004US08294

20040317; US20030456097P 20030320

AP - US20090409250 20090323

DT - **

CT - || R141 (A1)
[US6015440](#) A [];
[US5399731](#) A [];
[US7507846](#) B2 [];
[US5514820](#) A [];
[US5424467](#) A [];
[US6262285](#) B1 [];
[US6440057](#) B1 [];
[US3474131](#) A [];
[US5972057](#) A [];
[US6127560](#) A [];
[US5468887](#) A [];
[US3927982](#) A []

CCI - [C07C67/03](#) ; [C07C67/08](#) ; [C10L1/026](#) ; [C11C1/08](#) ; [C11C3/003](#) ; [C11C3/10](#)

CLC - [C07C67/03](#) , [C07C69/24](#) , INV
- [C07C67/03](#) , [C07C69/52](#) , INV
- [C07C67/08](#) , [C07C69/24](#) , INV
- [C07C67/08](#) , [C07C69/52](#) , INV

CCA - [Y02E50/13](#) ; [Y02P30/20](#) ; [Y02P20/582](#)

TI - (A1 B2)
METHOD AND APPARATUS FOR REFINING BIODIESEL

AB - (A1 B2)
Method and apparatus for producing **biodiesel** fuel, i.e., alkyl ester, from vegetable and/or animal oil. A transesterification catalyst is prepared in a base catalyst tank by spraying alkyl alcohol under pressure through jets at metal hydroxide pellets until the pellets have fully reacted with the alcohol. The oil is heated and transesterified in the presence of alkyl alcohol and the transesterification catalyst in a closed, recirculating transesterification flow system under slight cavitation to yield product alkyl ester and product glycerol. Cavitation is achieved by permitting air to enter the transesterification flow system through an adjustable air inlet valve. When permitted to stand, product alkyl ester forms an upper layer that is decanted and subjected to **purification** steps, to remove particulates and alkyl alcohol from the product alkyl ester, and a lower layer of product glycerol is drained away. **Purification** of the product alkyl ester preferably includes subjecting the product alkyl ester to an overhead **water** mist in a **wash** tank with simultaneous infusion of a stream of air bubbles. Alcohol vapor is reclaimed as liquid alcohol within an alcohol condenser and stored for reuse. If the oil contains free fatty acids, prior to transesterification, the oil is heated and the free fatty acids are esterified in the presence of an esterification catalyst and alkyl alcohol. For safety, baffles and explosion damper/flame arrestors are provided in locations where flammable vapors pose a risk.

concurrently purified and fractionated into a **biodiesel** fuel stream and a non-fuel fraction, each of which undergoes post treatment as needed. The **process** is optionally integrated with glycerin **purification** and/or methanol recovery.

9/14 © EPODOC / EPO

- PN - [WO2009038542](#) A2 20090326
- PNFP - WO2009038542 A3 20110922
- PR - ID20070000491 20070917
- AP - WO2008SG00350 20080915
- DT - *; Rep
- CT - |AT| ISR (A3)
[US2007033863](#) A1 20070215 [X] (BUTLER CHARLES D [US]);
[EP1331260](#) A2 20030730 [A] (IND MAN S A [ES])
- CCI - [C10L1/026](#) ; [C11C3/00](#) ; [C11C3/003](#)
- CCA - [Y02E50/13](#)
- PA - (A2 A3)
SIE HENDERY HENDERY [SG]
- TI - (A2 A3)
CATALYSTCRACKING/ **PURIFICATION OF BIODIESEL**
- AB - (A2 A3)
A **process** for the **purification** of crude **biodiesel** from glycerides comprising: a) contacting crude **biodiesel** feed with a mixture of **water wash** stream dan weak acid stream; b) separating **biodiesel** from **water wash** by phase separation wherein oily phase present in the top layer and gray **water wash** phase in the bottom layer; c) transferring the **biodiesel** stream to an evaporative device for further recovery of **biodiesel**; d) drying **biodiesel** from step c) then transferring it to storage.

10/14 © EPODOC / EPO

- PN - [RO121991](#) B1 20081030
- PR - RO20060000773 20061011
- AP - RO20060000773 20061011
- DT - I
- CCA - [Y02E50/13](#)
- PA - ARTEGO S A [RO]
- TI - **PROCESS AND INSTALLATION FOR PRODUCING BIODIESELFUEL**
- AB - The invention relates to a **process** and an installation for producing **biodiesel** fuel. According to the invention, the **process** consists in heating the raw oils up to the temperature of 38...42A C, admixing an alcoholic catalyst solution, in a ratio of 18...22% as compared with the oil, followed by the trans-esterification reaction at the

temperature of 45...50A C, gravimetric separation of raw glycerol, correction of the excess alcohol and technical glycerol, **purification of biodiesel** fuel by serially treating the same with an aqueous solution of phosphoric acid, aqueous solution of ammonia and a final **washing** with twice demineralized **water**, admixture of N-isopropyl-N-phenyl-p-phenylene diamine oxidation preventive agent into the liquid mass and subjecting the final product obtained thereby to cold filtration, at temperatures below 20...25A C.

11/14 © EPODOC / EPO

PN - [WO2004085579](#) A2 20041007

PNFP - WO2004085579 A3 20041229

PR - US20030456097P 20030320

AP - WO2004US08294 20040317

DT - *; Rep

CT - |US| ISR (A3)

[US3927982](#) A 19751223 [A] (CHAPMAN RODNEY M, et al);

[US5514820](#) A 19960507 [A] (ASSMANN GEORG [DE], et al)

CCI - [C07C67/03](#) ; [C07C67/08](#) ; [C10L1/026](#) ; [C11C1/08](#) ; [C11C3/003](#) ; [C11C3/10](#)

CLC - [C07C67/03](#) , [C07C69/24](#) , INV

- [C07C67/03](#) , [C07C69/52](#) , INV

- [C07C67/08](#) , [C07C69/24](#) , INV

- [C07C67/08](#) , [C07C69/52](#) , INV

CCA - [Y02E50/13](#) ; [Y02P30/20](#) ; [Y02P20/582](#)

PA - (A2 A3)

PELLY MICHAEL F [US]

TI - (A2 A3)

METHOD AND APPARATUS FOR REFINING BIODIESEL

AB - (A2)

Method and apparatus for producing **biodiesel** fuel, i.e., alkyl ester, from vegetable and/or animal oil. A transesterification catalyst is prepared in a base catalyst tank by spraying alkyl alcohol under pressure through jets at metal hydroxide pellets until the pellets have fully reacted with the alcohol. The oil is heated and transesterified in the presence of alkyl alcohol and the transesterification catalyst in a closed, recirculating transesterification flow system under slight cavitation to yield product alkyl ester and product glycerol. Cavitation is achieved by permitting air to enter the transesterification flow system through an adjustable air inlet valve. When permitted to stand, product alkyl ester forms an upper layer that is decanted and subjected to **purification** steps, to remove particulates and alkyl alcohol from the product alkyl ester, and a lower layer of product glycerol is drained away. **Purification** of the product alkyl ester preferably includes subjecting the product alkyl ester to an overhead **water** mist in a **wash** tank with simultaneous infusion of a stream of air bubbles. Alcohol vapor is reclaimed as liquid alcohol within an alcohol condenser and stored for reuse. If the oil contains free fatty acids, prior to transesterification, the oil is heated and the free fatty acids are esterified in the presence of an esterification catalyst and alkyl alcohol. For safety, baffles and explosion damper/flame arrestors are provided in locations where flammable vapors pose a risk.

12/14 © EPODOC / EPO

- PN - [US2006224005](#) A1 20061005
- PNFP - US7507846 B2 20090324
- PR - US20040547574 20040317; US20030456097P 20030320; WO2004US08294 20040317
- AP - US20040547574 20040317
- DT - **
- CT - || STSE (B2)
[US3474131](#) A 19691021 [] (SCHMERLING LOUIS)
[US6440057](#) B1 20020827 [] (ERGUEN NURHAN [AT], et al)
 - || R141 (A1)
[US5399731](#) A [];
[US5514820](#) A [];
[US5424467](#) A [];
[US6262285](#) B1 [];
[US6440057](#) B1 [];
[US3474131](#) A [];
[US5972057](#) A [];
[US6127560](#) A [];
[US5468887](#) A [];
[US3927982](#) A []
- CTNP - || STSE (B2)
 [] Knothe, G. et al., Biodiesel: The use of Vegetable Oils and Their Derivatives as Alternative Diesel Fuels, 1997, American Chemical Society, Chapter 10, pp. 172-207
 [] Konen, et al. Esterification of Unsaturated Fatty Acids, 1945, Oil & Soap, vol. 22, pp. 57-60
- CCI - [C07C67/03](#) ; [C07C67/08](#) ; [C10L1/026](#) ; [C11C1/08](#) ; [C11C3/003](#) ; [C11C3/10](#)
- CLC - [C07C67/03](#) , [C07C69/24](#) , INV
 - [C07C67/03](#) , [C07C69/52](#) , INV
 - [C07C67/08](#) , [C07C69/24](#) , INV
 - [C07C67/08](#) , [C07C69/52](#) , INV
- CCA - [Y02E50/13](#) ; [Y02P30/20](#) ; [Y02P20/582](#)
- TI - (A1 B2)
Method and apparatus for refining **biodiesel**
- AB - (A1 B2)
Method and apparatus for producing **biodiesel** fuel, i.e., alkyl ester, from vegetable and/or animal oil. A transesterification catalyst is prepared in a base catalyst tank by spraying alkyl alcohol under pressure through jets at metal hydroxide pellets until the pellets have fully reacted with the alcohol. The oil is heated and transesterified in the presence of alkyl alcohol and the transesterification catalyst in a closed, recirculating transesterification flow system under slight cavitation to yield product alkyl ester and product glycerol. Cavitation is achieved by permitting air to enter the transesterification flow system through an adjustable air inlet valve. When permitted to stand, product alkyl ester forms an upper layer that is decanted and subjected to **purification** steps, to remove particulates and alkyl alcohol from the product alkyl ester, and a lower layer of product glycerol is drained away. **Purification** of the product

alkyl ester preferably includes subjecting the product alkyl ester to an overhead **water** mist in a **wash** tank with simultaneous infusion of a stream of air bubbles. Alcohol vapor is reclaimed as liquid alcohol within an alcohol condenser and stored for reuse. If the oil contains free fatty acids, prior to transesterification, the oil is heated and the free fatty acids are esterified in the presence of an esterification catalyst and alkyl alcohol. For safety, baffles and explosion damper/flame arrestors are provided in locations where flammable vapors pose a risk.

13/14 © EPODOC / EPO

- PN - [US7126032](#) B1 20061024
- PR - US20060387654 20060323
- AP - US20060387654 20060323
- DT - *; Rep
- CCI - [C07C29/80](#) ; [C07C29/88](#)
- CLC - [C07C29/80](#) , [C07C31/225](#) , INV
- [C07C29/88](#) , [C07C31/225](#) , INV
- PA - SUNOCO INC R&M [US]
- TI - **Purification** of glycerin
- AB - A **process** for purifying glycerin recovered as a byproduct of **biodiesel** production comprises heating a glycerin effluent stream containing a low molecular weight alcohol, water and fatty acid esters of the low molecular weight alcohol to cause transesterification of the fatty acid esters to glycerides and additional low molecular weight alcohol. The reaction mixture is sparged with nitrogen to help remove water and low molecular weight alcohol, which drives the transesterification reaction towards glyceride formation. A **wash water** stream may also be added to the recovered glycerin stream from **biodiesel** production. Either before or following the transesterification reaction, an oil layer can be separated from the recovered glycerin stream by reducing the pH of the stream to below 7. Following separation of the oil layer and transesterification the glycerin stream is flash distilled to separate glycerin from water, salts, and glycerides.

14/14 © EPODOC / EPO

- PN - [FI931685](#) A 19941015
- PNFP - FI93315B B 19941215
- FI93315C C 19950327
- PR - FI19930001685 19930414
- AP - FI19930001685 19930414
- DT - I
- PA - (A B C)
TAMPELLA POWER OY [FI]
- TI - (B)
Process and plant for **purification** of flue gases
- AB - (A)
The invention relates to a **process** for the **purification** of flue gases in plants which generate flue gases containing sulphur dioxide and in which solid fuel is burnt. The

alkaline components of the ash produced in the burning of the solid fuel are guided to **water** and the **wash** liquid which is thereby obtained is conducted to a flue gas washer 3 for **purification** of the flue gases. As solid fuel **biofuel**, such as wood chippings, bark or straw, is used. The corresponding plant comprises a container 9 for guiding the alkaline components of the ash from the solid fuel boiler 2 to water, and a duct 10 and pumping member 11 between the container 9 and the flue gas washer 3 for conducting the wash liquid, which is constituted by the water containing alkaline components, to the flue gas washer 3. <IMAGE>