

1) Family number: 43713031 (JP2009178628A)

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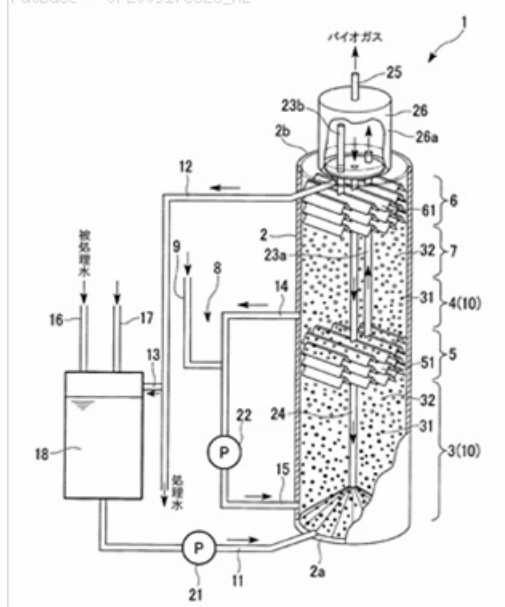
Title: APPARATUS FOR TREATING ANAEROBIC WASTE WATER**Priority:** JP20080017905 20080129

Family:	Publication number	Publication date	Application number	Application date
	JP2009178628 A2	20090813	JP20080017905	20080129
	JP4661882 B2	20110330	JP20080017905	20080129

Probable Assignee: IHI CORP**Assignee(s):(std):** IHI CORP**Inventor(s):(std):** KUNO TOMOAKI**International class**
(IPC 8-9): C02F3/28 (Advanced/Invention);
C02F3/28 (Core/Invention)**CPC:** C02F3/286 C02F3/2846 C12M21/04 C12M23/36 C12M29/02**European class:** C02F3/28N C02F3/28S C12M21/04 C12M23/36 C12M29/02[Classification Explorer](#)**Cited documents:** JP6019900 U1, JP2169098 A2, JP2003334585 A2, JP2000117284 A2,**Forward Citations:** WO14178711, WO13181422, US9090488, JP6000886, JP5989643, JP5600525, JP5192011, JP2014188486, JP2013533801, JP2012050910, JP2011206630, EP2669255, CN104445607, CN103232113, CN103232113,**Abstract:**

PROBLEM TO BE SOLVED: To provide an apparatus for treating anaerobic waste water, from which the amount of the granules flowing out together with the treated water can be reduced and which is excellent in stability of the capacity for treating anaerobic waste water and exhibits high efficiency when used for treating anaerobic waste water. **SOLUTION:** The apparatus 1 for treating anaerobic waste water is characterized in that the water to be treated is made to pass through an anaerobic sludge layer 10 comprising granules 31 as an upward flow to decompose the organic matter in the water to be treated and discharge the organic matter-decomposed water as the treated water. The anaerobic sludge layer 10 is composed of a high-concentration sludge layer 3 and a low-concentration sludge layer 4 which is arranged on the downstream side of the high-concentration sludge layer 3 and has the granule 31 concentration lower than that of the high-concentration sludge layer 3. A gas-liquid separating means 5 for collecting the gasses in the water to be treated is arranged between the high-concentration sludge layer 3 and the low-concentration sludge layer 4 and a circulation means 8 is arranged for withdrawing a part of the water to be treated in the low-concentration sludge layer 4 and supplying the withdrawn water to the uppermost-stream part of the high-concentration sludge layer 3.

PatBase - JP2009178628_A2

**2) Family number: 46542044** (US2012031835A)

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Title: REACTOR INLET**Priority:** DE200910008044 20090209 EP20090799070 20091210 WO2009EP66809 20091210

Family:	Publication number	Publication date	Application number	Application date
	CN102307818 A	20120104	CN200980156349	20091210
	CN102307818 B	20140312	CN200980156349	20091210
	DE102009008044 A1	20100812	DE200910008044	20090209

DE502009012543 D1	20160616	DE200950012543T	20091210
EP2393755 A1	20111214	EP20090799070	20091210
EP2393755 B1	20160504	EP20090799070	20091210
ES2585571 T3	20161006	ES20090799070T	20091210
PL2393755 T3	20171130	PL20090799070T	20091210
US2012031835 AA	20120209	US20110204258	20110805
US8337699 BB	20121225	US20110204258	20110805
WO10088993 A1	20100812	WO2009EP66809	20091210

Probable Assignee: VOITH PATENT GMBH

Assignee(s):(std): AQUATYX WASSERTECHNIK GMBH ; VOITH PATENT GMBH ; EFINGER DIETER ; GOMMEL AXEL ; GESSLER WERNER ; MULDER RONALD ; ABWICKLUNGSGESELLSCHAFT 4 IN 23 14 WAS SH AND E GMBH.. ; AQUATECH WATER TREAT TECHNOLOGY CO LTD

Assignee(s): AQUATECH WATER TREATMENT TECHNOLOGY CO

Inventor(s):(std): EFINGER DIETER ; GOMMEL AXEL ; GESSLER WERNER ; MULDER RONALD ; WERNER GESSLER ; AXEL GOMMEL ; DIETER EFINGER ; RONALD MULDER

Agent(s): MANITZ FINSTERWALD AND PARTNER GBR; LEHMANN MARIA ISABEL; TAYLOR IP PC

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): B01D21/02 C02F1/00 C02F103/28 C02F3/28 (Advanced/Invention); C02F103/28 (Advanced/Non-invention); B01D21/02 C02F1/00 C02F3/28 (Core/Invention)

CPC: C02F1/006 C02F3/2846 C02F3/2873 C02F2103/28 C02F2209/40

European class: C02F1/00R C02F3/28N C02F3/28T2 M02F103/28 M02F209/40

US class: 210/150 210/150S 210/260 210/601 210/603

[Classification Explorer](#)

Cited documents: WO08006596 A1, US5543141 A, US4780198 A, US4780198 A, US2010000940 AA, US2009223890 AA, EP1806323 A1, EP1806323 A1, EP1071636 B1, EP1071636, EP0493727 A1, EP0493727 A1, EP0170332 A1, EP0170332,

DE202006013811 U1

DE202006013811 U,

DE102006020709 A1

DE102006020709 A1

DE102004021022 B3

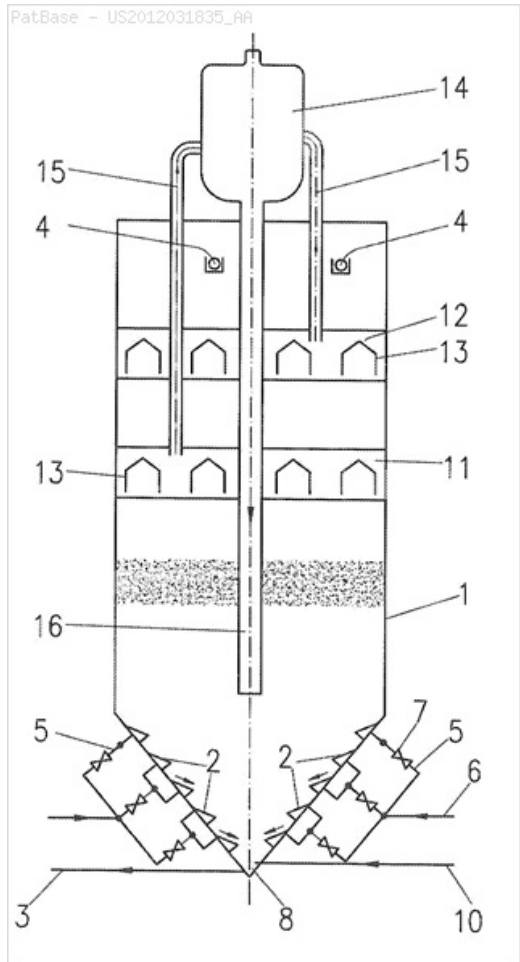
DE102004021022 B3

CN85106508 A, CN2672057 Y, CN101378998 A,

Forward Citations: WO13181422, WO13129901, US9758411, US9090488, KR20160132208,

Abstract:

The invention relates to a reactor for anaerobically purifying waster water, especially waste water from the paper industry, comprising a reactor vessel, several inlets arranged in the bottom region of the reactor vessel to feed waste water to be purified into the reactor, at least one outlet for discharging purified water, and at least one sediment drain. One or more inlets are fed by a supply pipe, and several supply pipes are fed by a collecting supply pipe. In order to ensure that waste water to be purified is fed as regularly as possible at the bottom of the reactor vessel, at least the majority of the supply pipes of a collecting supply pipe supply waste water to be purified to a maximum of 10 inlets, and at least the majority of said supply pipes each have a control valve.



3) Family number: 68797302 (US2019248686A)

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Title: ANAEROBIC PURIFICATION DEVICE WITH VARIABLE WATER COLUMN
Priority: EP20160187119 20160902 WO2017EP72119 20170904
Family:

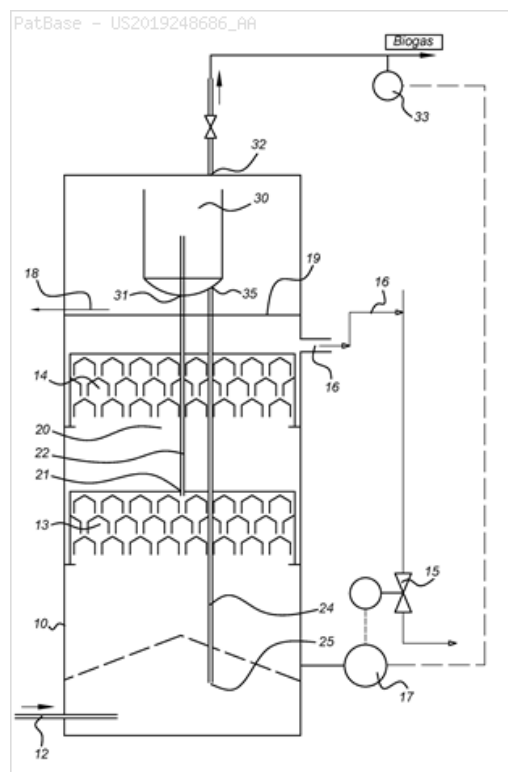
Publication number	Publication date	Application number	Application date
BR112019004159 A2	20190528	BR20191104159	20170904
CN109661377 A	20190419	CN201780054020	20170904
CO20190001809 A2	20190329	CO20190001809	20190227
EP3290395 A1	20180307	EP20160187119	20160902
EP3507250 A1	20190710	EP20170758572	20170904
ID201906195 A	20190823	ID2019PID00822	20170904
IN201917007562 A	20190517	IN201917007562	20190227
JP2019526441 T2	20190919	JP20190512302T	20170904
KR20190029734 A	20190320	KR20197005699	20170904
MX2019002352 A1	20190904	MX20190002352	20170904
US2019248686 AA	20190815	US20170329237	20170904
WO18042037 A1	20180308	WO2017EP72119	20170904

Probable Assignee: PAQUES IP BV
Assignee(s):(std): PAQUES I P BV ; PAQUES IP BV
Inventor(s):(std): JELLE HENDRIK DE BOER ; LEONARD HUBERTUS ALPHONSUS HABETS ; REMCO DE VRIES ; VERONICA HENRIKA JOHANNA GROOT KORMELINCK ; JACOB CORNELIS THEODORUS VOGELAAR ; VOGELAAR JACOB CORNELIS THEODORUS ; HABETS LEONARD HUBERTUS ALPHONSUS ; GROOT KORMELINCK VERONICA HENRIKA JOHANNA ; DE VRIES REMCO ; DE BOER JELLE HENDRIK
Agent(s): NEDERLANDSCH OCTROOIBUREAU; MAROLITA SETIATI
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT HW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW
International class (IPC 8-9): C02F3/00 C02F3/28 (Advanced/Invention)
International class (IPC 1-7): C02F3/28
CPC: C02F3/006 C02F3/2846 C02F3/2873 C02F2203/006 C02F2209/005 C02F2209/38 C02F2209/42 Y02E50/343 C02F2209/40
[Classification Explorer](#)
Cited documents: WO13119119 A1, US2013319935 AA, US2013319935, JP2009154156 A2, JP2009154156, JP2008543534

Abstract:

An anaerobic purification device for purification of wastewater, the anaerobic purification device comprising:

- a reactor tank (10) configured to, when in operation, have a sludge blanket formed at the bottom part;
- a fluid inlet (12) for, in operation, introducing influent into the reactor tank, the fluid inlet located in the lower section of the reactor tank (10);
- at least one gas-collecting system (13);
- at least one gas-liquid separation device (30);
- at least one riser pipe (22) connected to the at least one gas-collecting system (13) and discharging into the gas-liquid separation device (30);
- a downer pipe (24) connected to the gas-liquid separation device (30) and discharging into the bottom of the reactor tank (10); and
- a fluid outlet (16) comprising means for, in operation, varying the height of the fluid level (19) in the reactor tank within a predetermined range, the fluid outlet arranged at the upper section of the reactor tank (10); wherein the fluid level control means comprises:
 - a fluid valve (15) configured to control the height of the fluid in the reactor tank within the predetermined range,
 - a fluid level detector (17),
 - a gas flow meter (33) configured to measure the production rate of gas in the anaerobic purification device, and a controlling unit configured to regulate the fluid valve (15) to vary the height of the fluid level in the reactor tank (10) based on at least one of the fluid level detected by the fluid level detector (17) and the gas production rate detected by the gas flow meter (33).



4) Family number: 68797303 (US2019185356A)

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Title: DEGASSING DEVICE FOR ANAEROBIC PURIFICATION DEVICE

Priority: EP20160187135 20160902 WO2017EP72123 20170904

Family:

Publication number	Publication date	Application number	Application date
AU2017321056 AA	20190502	AU20170321056	20170904
BR112019004167 A2	20190528	BR20191104167	20170904
CA3033693 AA	20190212	CA20173033693	20170904
CN109689580 A	20190426	CN201780054036	20170904
CO20190001814 A2	20190329	CO20190001814	20190227
EP3290396 A1	20180307	EP20160187135	20160902
EP3507251 A1	20190710	EP20170765388	20170904
ID201905996 A	20190816	ID2019PID00823	20170904
IN201917007556 A	20190517	IN201917007556	20190227
JP2019529082 T2	20191017	JP20190512257T	20170904
KR20190032571 A	20190327	KR20197006071	20170904
MX2019002353 A1	20190904	MX20190002353	20170904
RU2712581 C1	20200129	RU20190109447	20170904
US2019185356 AA	20190620	US20170329232	20170904
WO18042039 A1	20180308	WO2017EP72123	20170904

Probable Assignee: PAQUES IP BV

Assignee(s):(std): PAQUES I P BV ; PAQUES IP BV

Assignee(s): VALLINGA ANTONIUS BERNARDUS ; VOGELAAR JACOB CORNELIS THEODORUS ; DE BOER JELLE HENDRIK ; GROOT KORMELINCK VERONICA HENRIKA JOHANNA ; HABETS LEONARD HUBERTUS ALPHONSUS

Inventor(s):(std): DE BOER JELLE HENDRIK ; ANTONIUS BERNARDUS VALLINGA ; GROOT KORMELINCK VERONICA HENRIKA JOHANNA ; HABETS LEONARD HUBERTUS ALPHONSUS ; VOGELAAR JACOB CORNELIS

THEODORUS ; VALLINGA ANTONIUS BERNARDUS ; JELLE HENDRIK DE BOER ; VERONICA HENRIKA JOHANNA GROOT KORMELINCK ; LEONARD HUBERTUS ALPHONSUS HABETS ; JACOB CORNELIS THEODORUS VOGELAAR

Agent(s): GRIFFITH HACK; RIDOUT AND MAYBEE LLP; NEDERLANDSCH OCTROOIBUREAU; MAROLITA SETIATI; YURIDICHESKAYA GORODISSKIJ I PARTNER Y OOO FA

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): B01D19/00 B04C5/02 C02F1/20 C02F1/38 C02F3/28 (Advanced/Invention); C02F1/20 C02F1/38 (Advanced/Non-invention)

International class (IPC 1-7): B01D19/00 C02F1/20 C02F1/38 C02F3/28

CPC: B01D19/0057 C02F1/20 C02F1/38 C02F3/2846 C02F3/2873 C02F2203/006 C02F3/28 B01D19/00

US class: 1/1

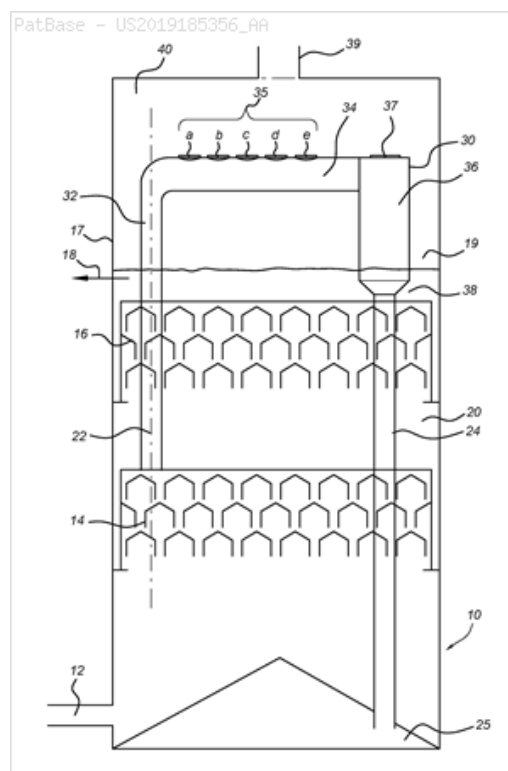
[Classification Explorer](#)

Cited documents: US4053291 A, US4053291, US2013319935 AA, US2013319935, UA91360 C2, RU2370450 C2, RU116487 U1, JP7507233 T2, JP61071896, JP2012525967 T2, JP2012250159, JP2008543534 T2, JP2002510551 T2, EP1888471 B1, EP0170332 B1, EP0170332 A1,

Abstract:

A gas-liquid separation device (30) for an anaerobic purification device for purification of wastewater, the gas-liquid separation device comprising:

- a gas-liquid riser pipe (32);
- a separation pipe (34) attached to the gas-liquid riser pipe (32), the separation pipe defining an angle with the direction perpendicular to the gas-liquid riser pipe between -45 degrees and +45 degrees, the separation pipe (34) configured to receive fluid from the gas-liquid riser pipe (32);
- at least one pipe gas outlet (35) located, when assembled with an anaerobic purification device, in a surface along the separation pipe (34) facing away from the ground, the at least one pipe gas outlet (35) configured to lead at least a portion of the gas in the separation pipe (34) outside the gas-liquid separation device;
- a hydraulic cyclone (36) attached to the separation pipe (34), the hydraulic cyclone configured to receive fluid from the separation pipe;
- at least one cyclone gas outlet (37) located in the upper side of the hydraulic cyclone (36); the at least one cyclone gas outlet configured to lead the gas entering the hydraulic cyclone (36) outside the hydraulic cyclone; and
- a liquid outlet (38) attached to the bottom part of the hydraulic cyclone (36), the liquid outlet configured to guide degassed fluid outside the hydraulic cyclone.



5) Family number: 47528307 (US2012115218A)

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Title: BIOREACTOR COMPRISING A MIXING CHAMBER
Priority: EP20090159341 20090504 WO2010NL50254 20100503
Family:

Publication number	Publication date	Application number	Application date
AU2010245369 AA	20111124	AU20100245369	20100503
AU2010245369 AA	20101111	AU20100245369	20100503
AU2010245369 BB	20160804	AU20100245369	20100503
BRPI1014103 A2	20160412	BR2010PI14103	20100503
BRPI1014103 B1	20200204	BR2010PI14103	20100503
CA2760909 AA	20101111	CA20102760909	20100503

CA2760909 C	20180529	CA20102760909	20100503
CL2011002773 A1	20120217	CL20110002773	20111104
CL52293 B	20160321	CL20110002773	20111104
CL52293 B	20160324	CL20110002773	20111104
CN102482128 A	20120530	CN201080024513	20100503
CN102482128 B	20140122	CN201080024513	20100503
DE602009033631 D1	20151029	DE200960033631T	20090504
DK2248771 T3	20151214	DK20090159341T	20090504
EP2248771 A1	20101110	EP20090159341	20090504
EP2248771 B1	20150916	EP20090159341	20090504
ES2553589 T3	20151210	ES20090159341T	20090504
HU025956 T2	20160530	HU20090159341T	20090504
IN08562DN2011 A	20130111	IN2011DN08562	20111103
JP2012525967 T2	20121025	JP20120509747T	20100503
JP5478717 B2	20140423	JP20120509747T	20100503
KR101833550 B1	20180413	KR20117028974	20100503
KR20120058463 A	20120607	KR20117028974	20100503
MX2011011696 A1	20111208	MX20110011696	20100503
PL2248771 T3	20160229	PL20090159341T	20090504
PT2248771 T	20151130	PT20090159341T	20090504
RU2011149237 A	20130610	RU20110149237	20100503
RU2520451 C2	20140627	RU20110149237	20100503
TH118627 A	20121227	TH20111002951	20100503
TH68332 B	20190222	TH20111002951	20100503
TR201515993 T4	20151221	TR20150015993T	20090504
US2012115218 AA	20120510	US20100318605	20100503
US9233865 BB	20160112	US20100318605	20100503
VN15331 A1	20160525	VN20110003309	20100503
WO10128850 A1	20101111	WO2010NL50254	20100503
ZA201108216 A	20120725	ZA20110008216	20111109

Probable Assignee: PAQUES BIO SYSTEMS BV

Assignee(s):(std): FRANKENA DOUWE ; PAKVES I P BV ; PAQUES BIO SYST BV ; VELLINGA SJOERD HUBERTUS JOSEF ; PAQUES IP BV ; PAQUES I P BV ; VELLINGA SJOERD HUBERTUS JOZEF

Assignee(s): PAQUES IPBV ; PAQUES BIO SYSTEMS BV ; PAQUES BIO SYSTEMS B V ; PAKVES IPBV

Inventor(s):(std): FRANKENA DOUWE ; VELLINGA SJOERD HUBERTUS JOSEF ; DOUWE FRANKENA ; JOSEF VELLINGA SJOERD HUBERTUS ; VELLINGA SJOERD HUBERTUS JOZEF ; VELLINGA SHURD KHUBERTUS JOZEF ; FRANKENA DAUVE ; SJOERD HUBERTUS JOSEF VELLINGA

Inventor(s): FRANKENA DOUWE VELLINGA SJOERD HUBERTUS JOZEF ; SJOERD HUBERTUS JOZEF VELLINGA

Agent(s): GRIFFITH HACK; BLAKE CASSELS AND GRAYDON LLP; CLARKE MODET; KILBURN AND STRODE LLP; KETELAARS MAARTEN F J M; NEDERLANDSCH OCTROOIBUREAU; TOMAS TESIFONTE ENRIQUE; TOLGA CAYLAK; TUCKER ELLIS LLP; KETELAARS MAARTEN

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): B01F15/02 B01F3/08 B01F5/04 C02F11/02 C02F3/28 C12M1/00 C12M1/02 C12M3/00 (Advanced/Invention); C12M1/00 (Core/Invention); C02F (Subclass/Invention)

International class (IPC 1-7): B01F3/08 B01F5/04 C02F3/28 C12M1/00

CPC: C02F3/2846 C02F3/2853 C02F2203/006 C12M23/34 C12M27/00 Y02W10/12

European class: C02F3/28N M02F203/00D M02F3/28P

US class: 1/1 366/154.1 366/154.100S 435/294.1 435/294.100P

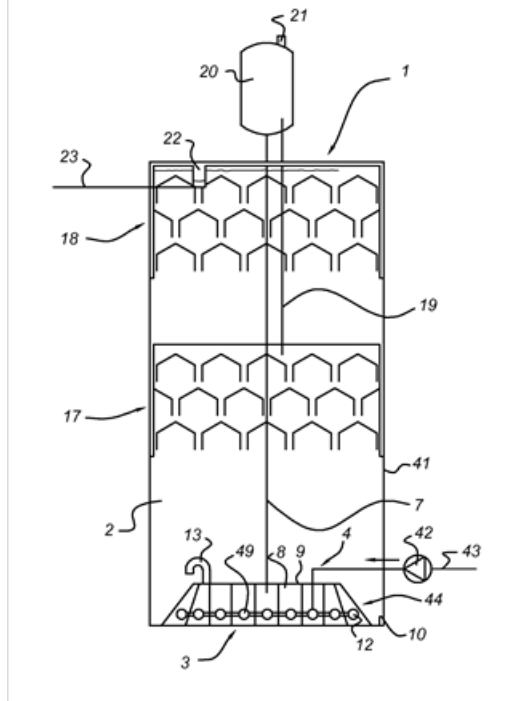
[Classification Explorer](#)

Cited documents: WO9201637 A1, WO10128851 A1, US6602416 BA, US6063273 A, US538447 A, US5338447 A, US5338447, US4707252 A, US4426450 A, US4426450, US4202774 A, RU2344998 C1, RU2139132 C1, RU2060964 C1, KR20010016298, JP7029109 B2, JP63305993 A2, JP2007029109 A2, JP2001507619 T2, JP2001276856 A2, EP91912937, EP0539430 B1, EP0539430 A1, DE3623431 A1, CN101092268 A, CN101007680 A, CA1212790 A1,

Forward Citations: WO13181422, US9090488, JP5989643, JP2019529082, JP2013533801,

Abstract:

The invention relates to a bioreactor (1) comprising a reactor vessel (41) having a mixing chamber (3) separated by a partition (44) from a reaction chamber (2) located generally above the mixing chamber (3), the mixing chamber (3) having an inlet system (4) for influent or a mixture of influent and recycled material, wherein the inlet system (4) has an outlet opening (60-64) in the mixing chamber (3). In an embodiment the partition (44) has an opening (66) forming a connection between the mixing chamber (3) and the reaction chamber (2), wherein the outlet opening (60-64) of the inlet system (4) is directed at the opening in the partition. In an embodiment the mixing chamber (3) has a skeleton for reinforcing the mixing chamber.

**6) Family number: 40883410** (US2010000940A)

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Title: REACTOR COMPRISING A SUPPLY DISTRIBUTION SYSTEM FOR ANAEROBIC WASTE WATER TREATMENT

Priority: DE200610032489 20060713 DE200620013811U 20060908 WO2007EP06216 20070712
EP20070786044 20070712

Family:

Publication number	Publication date	Application number	Application date
AT465979 E	20100515	AT20070786044T	20070712
DE102006032489 A1	20080117	DE200610032489	20060713
DE102006032489 B4	20080626	DE200610032489	20060713
DE202006013811 U1	20071122	DE200620013811U	20060908
DE502007003613 D1	20100610	DE200750003613T	20070712
EP2041035 A1	20090401	EP20070786044	20070712
EP2041035 B1	20100428	EP20070786044	20070712
ES2345368 T3	20100921	ES20070786044T	20070712
PL2041035 T3	20110228	PL20070786044T	20070712
US2010000940 AA	20100107	US20070373465	20070712
US7919000 BB	20110405	US20070373465	20070712
WO08006596 A1	20080117	WO2007EP06216	20070712

Probable Assignee: AQUATYX WASSERTECHNIK GMBH

Assignee(s):(std): AQUATYX WASSERTECHNIK GMBH ; EFINGER DIETER ; KNOERLE ULRICH ; MERI
ENTSORGUNGSTECHNIK FUER D ; MERI ENTORGUNGSTECHNIK F DIE PAPIERINDUSTRIE GMBH ;
KNOERLE ULRICH ; MENKE LUKAS ; MERI ENVIRONMENTAL SOLUTIONS G ; MERI ENTORGUNGSTECH
PAPIERIND ; MERI ENTORGUNGSTECHNIK FUER DIE PAPIERINDUSTRIE GMBH ; MERI ENV SOLUTIONS
GMBH ; TROUBOUNIS GEORGIOS ; TROUBOUNIS GEORGLOS

Assignee(s): MERI ENVIRONMENTAL SOLUTIONS GMBH

Inventor(s):(std): KNOERLE ULRICH ; TROUBOUNIS GEORGIOS ; MENKE LUKAS ; EFINGER DIETER ; TROUBOUNIS
GEORGLOS ; KNOERLE ULRICH ; KNORLE ULRICH ; KNA RLE ULRICH

Agent(s): MANITZ FINSTERWALD AND PARTNER GBR ; GREENBLUM AND BERNSTEIN PLC ; MANITZ FINSTERWALD
PARTNER GBR

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY
CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN
IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW
MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ
TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class
(IPC 8-9): C02F1/00 C02F3/28 (Advanced/Invention);
C02F1/00 (Advanced/Non-invention);
C02F1/00 C02F3/28 (Core/Invention);
C02F1/00 (Core/Non-invention)

CPC: C02F1/006 C02F3/2846 C02F3/2873 C02F11/04 C02F2103/28 C12M21/04 C12M27/20 C12M47/02
Y10S210/928

European class: C02F1/00R C02F3/28N C02F3/28T2 C12M21/04 C12M27/20 C12M47/02 M02F103/28 M02F11/04

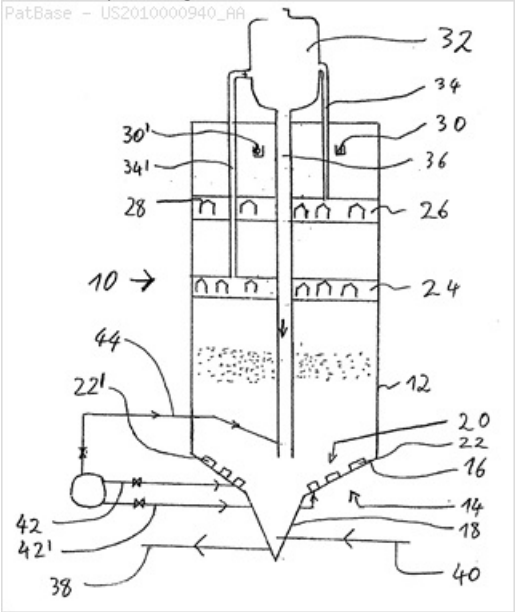
US class: 210/202 210/202S 210/512.1 210/601 210/603 210/928

[Classification Explorer](#)

Cited documents: WO6132523, WO06132523 A1, WO04035486 A1, US5409610 A, US4726899 A, US3527575 A,
US2006065593 AA, US2003038079 AA, EP1609763 A1, EP1553058 A1, EP1071636 B1, EP0948463 B1,
EP0539430 B1, EP0493727 A1, EP0170332 A1, EP0153299 A1, DE4208148 A1, DE4042223 A1,
DE19815616 A1, DE1667058 A1, DE10358400 A1,

Forward Citations: WO11020651, WO10088993, WO10088992, WO10026314, US9154056, US9090488, US8663468, US8354027, US8337699, US2013319935, US2012018372, US2011273058, FR2935373, ES2541078, EP3009408, EP3009408, EP2393755, DE102009037953, DE102009008044, CN105152321, CN105152321, CN102471109, CN102471109, CN102307818,

Abstract:
Disclosed is a reactor for anaerobically treating waste water, especially treating waste water from the paper industry. Said reactor comprises a reactor vessel, at least one supply pipe which is arranged in the bottom area of the reactor vessel and is used for feeding waste water that is to be treated into the reactor, at least one supply distributor for mixing the waste water fed to the reactor with the medium located in the reactor, at least one overflow port which is disposed on the top reactor vessel and is used for discharging treated water, and at least one separator. The supply distributor is provided with at least one deflection means that is embodied such that waste water discharged from the at least one supply pipe is diverted into a circular current from the perspective of the cross-section of the reactor, one to 80 percent of the cross-section of the reactor being filled by the at least one deflection means. The invention further relates to a method for anaerobically treating waste water.



7) Family number: 33277569 (US2006191834A) © PatBase

Title: APPARATUS FOR MAGNETIC FIELD AND MAGNETIC GRADIENT ENHANCED FILTRATION
Priority: US20050653702P 20050217 US20060353659 20060214 EP20060735435 20060217
WO2006US05773 20060217
Family:

Publication number	Publication date	Application number	Application date
CN101160177 A	20080409	CN200680012786	20060217
CN101160177 B	20101110	CN200680012786	20060217
EP1850964 A1	20071107	EP20060735435	20060217
EP2653234 A2	20131023	EP20130176493	20060217
EP2653234 A3	20161109	EP20130176493	20060217
JP2008529794 T2	20080807	JP20070556347T	20060217
JP5243803 B2	20130724	JP20070556347T	20060217
KR101302309 B1	20130830	KR20077021099	20060217
KR20070104469 A	20071025	KR20077021099	20060217
US2006191834 AA	20060831	US20060353659	20060214
US8066877 BB	20111129	US20060353659	20060214
WO06089186 A1	20060824	WO2006US05773	20060217

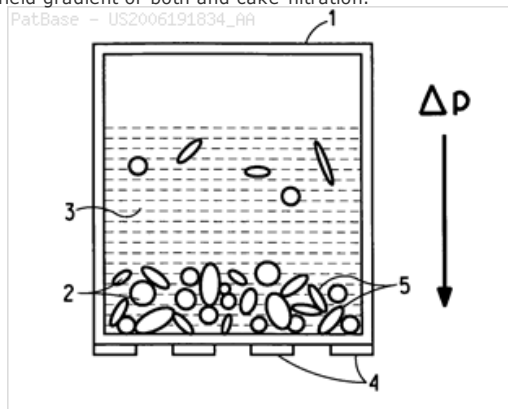
Probable Assignee: E I DU PONT DE NEMOURS AND CO
Assignee(s):(std): DU PONT ; KELLER KARSTEN ; FUCHS BENJAMIN ; HOFFMAN CHRISTIAN ; HOFFMANN CHRISTIAN K ; EIDU PONT DE NEMOURS AND CO
Assignee(s): E I DU PONT DE NEMOURS AND CO ; E I DU PONT DE NEMOURS AND COMPANY ; E I DUPONT DE NEMOURS AND COMPANY ; EI DU PONT DE NEMOURS AND CO
Inventor(s):(std): HOFFMANN CHRISTIAN K ; KARSTEN KELLER ; BENJAMIN FUCHS ; CHRISTIAN HOFFMAN ; HOFFMAN CHRISTIAN ; FUCHS BENJAMIN ; KELLER KARSTEN
Agent(s): HUGHES ANDREA MICHELLE; E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER; E I DU PONT DE NEMOURS AND CO LEGAL PATENT RECORDS CENTER
Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
International class (IPC 8-9): B01D29/00 B01D35/06 B03C1/00 B03C1/28 B03C1/30 (Advanced/Invention); B01D35/06 B03C1/00 B03C1/02 (Core/Invention)
CPC: B03C1/286 B03C2201/18 B01D35/06 B03C1/30
European class: B01D35/06 B03C1/28H B03C1/30 L03C201/18
US class: 204/664 210/222 210/223 210/295 210/323.2 210/348 210/348S 210/416.1 210/513
[Classification Explorer](#)
Cited documents: WO06107288 A2, US7070684 BA, US6517813 BA, US6464863 BA, US6273265 BA, US6150182 A, US6000405 A, US5954933 A, US5565105 A, US5244580 A, US5183638 A, US4784758 A, US4279748 A, US4238326 A, US4166788 A, US4144163 A, US4017385 A, US3902994 A, US3696932 A, US3534902 A,

US3195728 A, US2648636 A, US2006281194 AA, US2006180538 AA, US2005261479 AA, US2005252864 AA, US2003146174 AA, US1527070 A, US1527069 A, JPS624416, JPS6210014 U, JPS6071323 U, JPS54119175, JPS4413472 B1, JP9276624 A2, JP9276624, JP62079861 A2, JP62010014 U1, JP62010014 U, JP62004416 A2, JP62004416, JP61106519 A2, JP60071323 U1, JP60071323 U, JP58088043 A2, JP54119175 A2, JP54119175, JP53109272 A2, JP44013472 B4, JP44013472 B1, JP2003144973 A2, JP2002079011 A2, JP2000312838 A2, GB2153707 A1, GB1490598 A, FR2128128 A3, FR2128128 A1, EP0659932 A2, DE8717143 U1,

Forward Citations: WO14191636, WO13181422, WO08076308, US9090488, US8882997, US8119010, US8075771, US8012451, US8012357, US8012355, US7906023, US7468175, US2011163017, US2010285955, US2008272065, US2008156709, US2006180538, US2005252864, EA029366, CN105307748, CN102740981, CN102740981,

Abstract:

This invention relates to various apparatus for carrying out cake-filtration solid-liquid separation processes in which the solid-liquid mixture is subjected to a homogeneous magnetic field, a magnetic field gradient or both and cake-filtration.



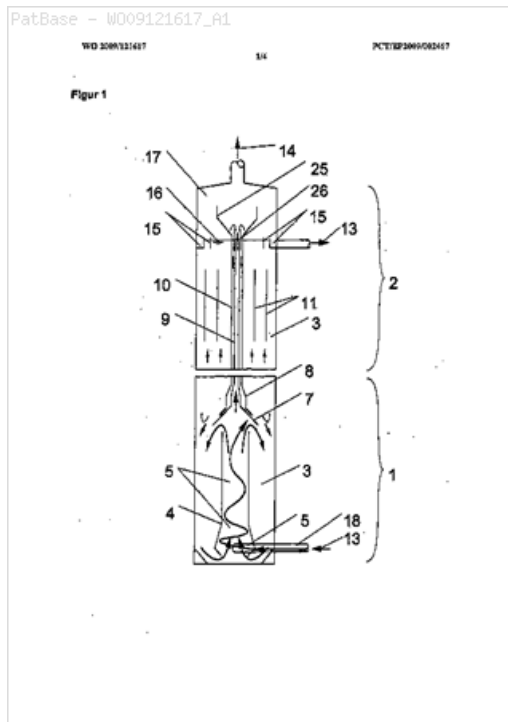
8) Family number: 43805570 (WO09121617A1)

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Title:	REACTOR FOR ANAEROBICALLY TREATING WASTE WATER																												
Priority:	DE200810017008 20080403		EP20090727640 20090403		WO2009EP02467 20090403																								
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Publication number	Publication date	Application number	Application date																										
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Probable Assignee:	BREMER PRO AQUA WASSER U ABWASSERTECHNIK GMBH																												
Assignee(s):(std):	BREMER PRO AQUA WASSER U ABWASSERTECHNIK GMBH ; EGGERT WOLFGANG ; RISSE HENRY ; WEINHOLD GERD																												
Inventor(s):(std):	RISSE HENRY ; EGGERT WOLFGANG ; WEINHOLD GERD																												
Agent(s):	VON ROHR PATENTANWALTE PARTNERSCHAFT MBB; STREHLKE INGO KURT; VON ROHR; STREHLKE INGO K																												
Designated states:	AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN VZ ZA ZM ZW																												
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European class:	C02F3/28N M02F301/02B M02F301/02F Y02E50/34B																												
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Cited documents:	EP1408008 B1, EP1408008 A1, EP0808805 A1, EP0268225 A2, DE4208148 A1, DE4138599 A1, DE3810843 A1,																												
Forward Citations:	WO13181422, WO13053592, US9090488, CN107162178, CN106242050,																												

Abstract:

The invention relates to a reactor and to a method for anaerobically treating waste water or similar by means of an anaerobic biological reaction of organic compounds and/or contaminants using biomasses which are granulated and/or flocculated and/or fixed to fluidised support materials. Said reactor comprises a waste water line (18) and at least one inlet cyclone (4) in the lower area (1) into which the waste water can be introduced in a tangential manner and creates an upwardly directed eddy current within the cyclone (4).



9) Family number: 71971673 (US2018334401A)

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Title: PLANT FOR THE PURIFICATION OF WASTE AND/OR PROCESS WATER BY MEANS OF ANAEROBIC MICROORGANISMS WITH A REACTOR TANK AND AN EXTERNAL SEPARATION APPARATUS

Priority: US20170601074 20170522

Family:	Publication number	Publication date	Application number	Application date
	US2018334401 AA	20181122	US20170601074	20170522
	WO18217587 A1	20181129	WO2018US33554	20180518

Probable Assignee: VOITH MERI ENVIRONMENTAL SOLUTIONS INC

Assignee(s):(std): VOITH MERI ENV SOLUTIONS INC

Assignee(s): VOITH MERI ENVIRONMENTAL SOLUTIONS INC

Inventor(s):(std): LEITNER BRAD ; BLASZCZYK LEWIS ; TROUBOUNIS GEORGE ; MENKE LUCAS

Agent(s): RZUCIDLO EUGENE C

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class C02F3/28 C02F3/34 (Advanced/Invention);
(IPC 8-9): B01D21/00 C02F1/38 (Advanced/Non-invention)

CPC: C02F3/2866 C02F3/2893 C02F2003/008 C02F3/34 C02F3/28 C02F3/282 B01D21/0045 C02F1/38 C02F3/286 C02F9/00 C02F2203/00 C02F2301/046

US class: 1/1 210/188

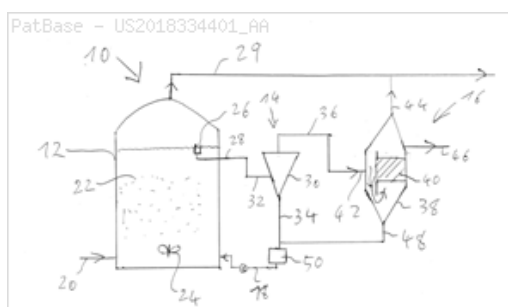
[Classification Explorer](#)

Cited documents: WO11071013 A1, US9090488 BB, US2002000409 AA, KR20070002382 A, EP2065344 A1,

Abstract:

A plant for the anaerobic purification of waste and/or process water comprising:

- i) a reactor tank with at least one feed line for supplying waste and/or process water into tank and with at least one outflow line for draining a mixture of microorganisms, waste and/or process water and gas from the tank,
- ii) a first separation apparatus outside and downstream of the tank for separating at least a part of the microorganisms from the mixture from the tank, wherein the first separation apparatus comprises at least one separation stage, an inlet line connected with at least one of the outflow line(s), at least one discharge line and at least one outlet line, and
- iii) a return line for returning the separated sludge separated into the reactor tank, wherein the return line connects with at least one of the at least one outlet line of the first separation apparatus.

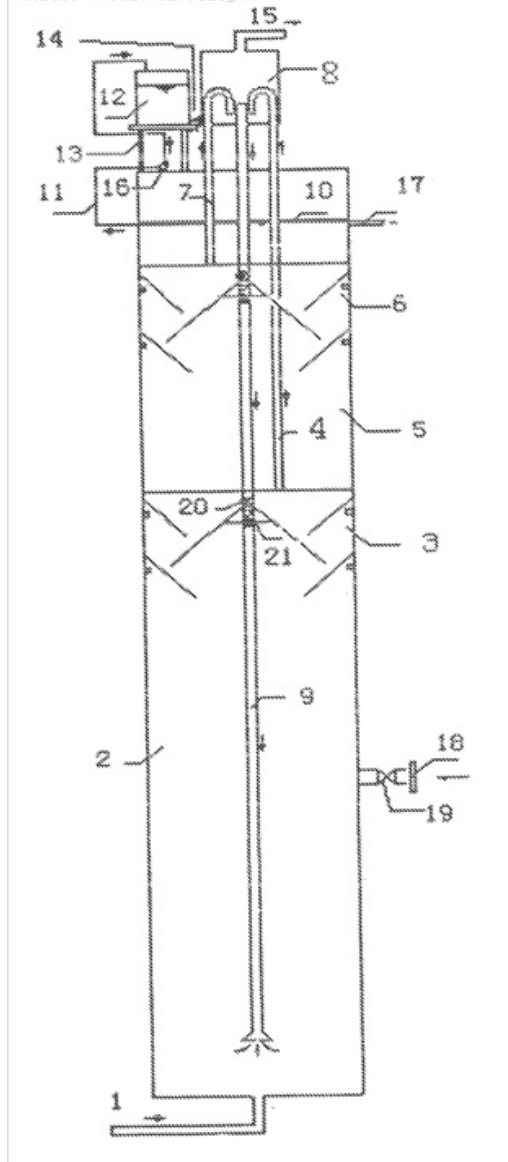


Title: UP-FLOW MULTI-STAGE ANAEROBIC REACTOR (UMAR)**Priority:** US20070744883 20070507

Family:	Publication number	Publication date	Application number	Application date
	US2008277328 AA	20081113	US20070744883	20070507
	US7537693 BB	20090526	US20070744883	20070507

Probable Assignee: GUANGXI BOSSCO ENVIRONMENTAL PROTECTION TECHNOLOGY CO LTD**Assignee(s):(std):** WANG SHUANGFEI ; ZHAO JOE R H**Assignee(s):** GUANGXI BOSSCO ENVIRONMENTAL PROTECTION TECHNOLOGY ; GUANGXI BOSSCO ENVIRONMENTAL PROTECTION TECHNOLOGY CO LTD**Inventor(s):(std):** WANG SHUANGFEI ; ZHAO JOE R H**Agent(s):** DR JOE R H ZHAO TRI Y ENTERPRISES LTD**International class (IPC 8-9):** B01D19/00 C02F3/00 C02F3/28 (Advanced/Invention); B01D19/00 C02F3/00 C02F3/28 (Core/Invention)**CPC:** Y02E50/343 B01D19/0047 C02F3/2846 C02F3/2873**European class:** B01D19/00P2 C02F3/28N C02F3/28T2**US class:** 210/188 210/194 210/603 210/603S[Classification Explorer](#)**Cited documents:** US6592751 BB, US2003062305 AA,**Forward Citations:** WO13181422, US9090488, US2013126424, JP5893187, JP2015142922, CN107473376, CN107473376, CN106745708, CN105800781, CN105753136, CN105254002, CN105174449, CN105174446, CN105174446, CN105110563, CN105110463, CN105084532, CN104817231, CN104710019, CN104710019, CN104310579, CN104193002, CN104193002, CN104150593, CN104150593, CN103922471, CN103922471, CN103663684, CN103663684, CN103288208, CN103288208, CN102976485, CN102701530, CN102701530, CN102583725, CN102442753, CN102153197, CN102139955,**Abstract:**

The present invention discloses an Up-flow Multi-stage Anaerobic Reactor (UMAR) used for treatment of medium/high concentration organic wastewater. The stated UMAR with forced internal circulation, improved phase separator and added sludge inlet overcomes the disadvantages of a lower load, a longer hydraulic retention time and a larger dimension in traditional anaerobic reactors. The forced internal circulation increases capacity and cycles of internal circulation thus increased efficiency of contaminant removal. The fast jetting is avoided and efficiency of gas/liquid separation is increased by an improved bending outlet of up flow pipe. The simplified sludge addition and usage are obtained by a sludge inlet. The load of UMAR in this invention can reach about 30 kgCOD/(m³d) for treatment of medium/high concentration of organic wastewater from pulp and paper process and similar wastewater, being about four times of load and capacity of traditional Up-flow Anaerobic Sludge Bed (UASB) reactors.

**11) Family number: 20715783** (US6478963B)

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Title: METHOD AND DEVICE FOR ANAEROBIC PURIFICATION OF WASTE WATER USING THE UASB METHOD
Priority: DE19981015616 19980407 DE19995000803 19990406 WO1999EP02325 19990406
Family:

Publication number	Publication date	Application number	Application date
AU199933335 A1	19991025	AU19990033335	19990406
DE19815616 A1	19991014	DE19981015616	19980407
DE59900803 D1	20020314	DE19995000803	19990406
EP1071636 A1	20010131	EP19990914569	19990406
EP1071636 B1	20020130	EP19990914569	19990406
ES2173731 T3	20021016	ES19990914569T	19990406
HU0101555 AB	20010928	HU20010001555	19990406
HU0101555 AC	20011228	HU20010001555	19990406
JP2002510551 T2	20020409	JP20000542258T	19990406
JP3621967 B2	20050223	JP20000542258T	19990406
KR100398774 B1	20030919	KR20007011115	20001006
KR20010034750 A	20010425	KR20007011115	19990406
TR200002815 T2	20001221	TR20000002815T	19990406
US6478963 BA	20021112	US20000647944	20001227
WO9951532 A1	19991014	WO1999EP02325	19990406

Probable Assignee: USF DEUTSCHLAND GMBH GUTLING

Assignee(s):(std): ROSSMANITH PETER ; USF DEUTSCHLAND GMBH GUTLING ; USF DEUTSCHLAND GMBH ; ZEPPELIN SILO AND APPTECH GMBH ; USF DEUTSCHLAND GMBH GUTLING ; ZEPPELIN SILO U APP TECHNIK ; ZEPPELIN SILO U APPARATETECHNIK GMBH ; ZEPPELIN SILO UND APP TECHNIK ; EPELIN SILO UND APP TECHNIK

Assignee(s): EPELIN SILO UND APPARATETECHNIK GMBH ; USF DEUTSCHLAND GMBH GUTLING FELLBACH ; USF DEUTSCHLAND GMBH GUTLING ; ZEPPELIN SILO UND APPARATETECHNIK GMBH

Inventor(s):(std): PETER ROSSMANITH ; ROSSMANITH PETER

Designated states: AE AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC

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UA UG US UZ VN YU ZA ZW

International class
(IPC 8-9):

C02F3/22 C02F3/28 (Advanced/Invention);
C02F3/22 C02F3/28 (Advanced/Non-invention);
C02F3/22 C02F3/28 (Core/Invention)

International class
(IPC 1-7):

C02F3/22 C02F3/28

CPC:

C02F3/2846 C02F3/2873

European class:

C02F3/28N C02F3/28T2

US class:

210/188 210/195.3 210/197 210/603 210/605

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Cited documents:

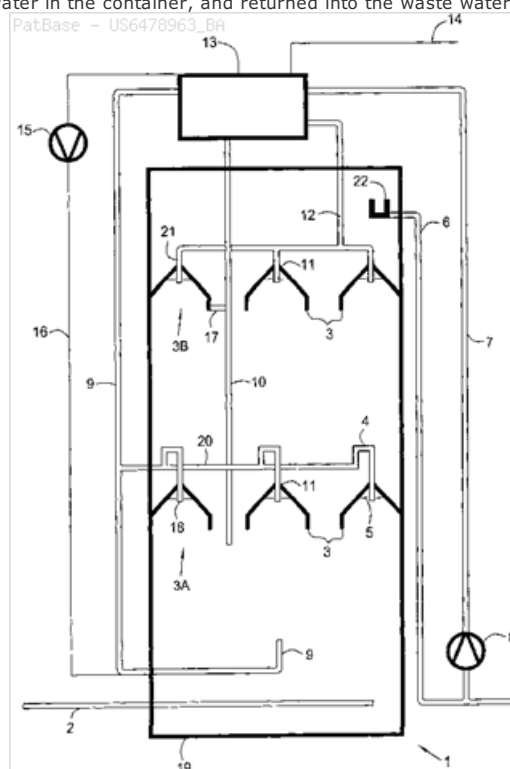
WO9623735 A1, WO9324417 A1, US5500118 A, US5441634 A, US5338445 A, US5298163 A, US4758339 A, US4482458 A, US4253956 A, US4009098 A, US3242071 A, US2638444 A, JP60220194 A2, EP0342722 A1, EP0170332 A1,

Forward Citations:

WO19219484, WO14021599, WO14012817, WO13181422, WO13053592, WO11020651, WO09121610, WO06133467, WO05121031, WO0238509, US9221986, US9090488, US8721877, US8663468, US8337699, US8163075, US8147608, US8118924, US7964033, US7947178, US7927416, US7919000, US7744754, US7735505, US7597801, US7531085, US7410570, US7374683, US6602416, US2010254697, US2010196010, US2010043857, US2009038666, US2008317946, US2008264844, US2008264840, US2007227972, US2007151909, KR101503116, JP4966968, JP4687600, JP2019529082, JP2008543534, JP2008029993, EP2393755, EP2060542, EP2060541, EP1205442, DE202006013811, DE102018003969, DE102012212675, DE102011084272, DE102009037953, DE102009008044, DE102009008042, DE102008061461, DE102008017020, DE102007054211, DE102007054210, DE102007054209, DE102007054208, DE102007054207, DE102005050997, DE102005050997, DE102004021022, CN106190792, AU2014200009,

Abstract:

Described is a method and a device for purifying waste water, in particular by means of anaerobic purification. The method is carried out in a waste water- and sludge-receiving container under generation of gas, the developing gas being trapped by a gas collector and the circulation formed by the ascending gas being used for loosening the sludge which has settled on the bottom of the container. Such a method is to be developed in a constructionally simple and more efficient way. To this end the settled sludge should be sucked from the bottom by a gas lifting effect provided by the ascending gas, and should be passed into the upper portion of the container in a condition separated from the waster water in the container, and returned into the waste water.



12) Family number: 45436836 (US2011236274A)

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Title:

UPFLOW REACTOR FEATURING CONTROLLED RECIRCULATION OF BIOMASS

Priority:

DE200810061461 20081210 EP20090799519 20091204 WO2009EP08663 20091204

Family:

Publication number	Publication date	Application number	Application date
BRPI0923247 A2	20160126	BR2009PI23247	20091204
DE102008061461 A1	20100617	DE200810061461	20081210
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ES2398636 T3	20130320	ES20090799519T	20091204
PL2376392 T3	20130430	PL20090799519T	20091204
RU2011128387 A	20130120	RU20110128387	20091204
RU2522105 C2	20140710	RU20110128387	20091204
US2011236274 AA	20110929	US20090132928	20091204
US8721877 BB	20140513	US20090132928	20091204

Probable Assignee: MCB GMBH

Assignee(s):(std): BUCHMUELLER MARIANNE ; MCB GMBH ; MKB GMBKH

Inventor(s):(std): BUKHJMULLER MARIANNE ; BUCHMULLER MARIANNE ; BUCHMUELLER MARIANNE

Inventor(s): MARIANNE BUCHMULLER

Agent(s): PLATE SCHWEITZER ZOUNEK PATENTANWALTE; PLATE JUERGEN; CARPINTERO MARIO; PROPAT LLC; PLATE JUERGEN ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

International class (IPC 8-9): B01D19/00 B01D35/00 B01J8/00 C02F11/04 C02F3/02 C02F3/28 C02F3/30 C12M1/107 (Advanced/Invention); C02F101/30 (Advanced/Non-invention); C02F3/28 C02F3/30 C12M1/107 (Core/Invention)

CPC: C02F3/006 C02F3/2846 C02F3/2873 C02F2209/005 C12M21/04 C12M23/34 C12M23/36 C12M29/00 C12M47/02

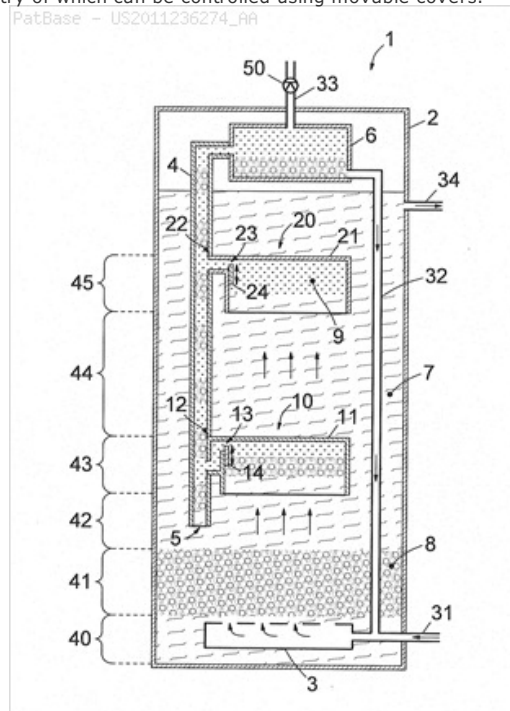
European class: C02F3/00R C02F3/28N C02F3/28T2 C12M21/04 C12M23/34 C12M23/36 C12M29/00 C12M47/02 M02F209/00T

US class: 210/120 210/188 210/197 422/187 422/187P
[Classification Explorer](#)

Cited documents: WO9951532 A1, US7460013 BA, US7279101, US4295795 A, SU1220344, RU2315721, RU2165392, RU2052732, EP1408008 A1, EP1408008 A1, EP0711732 A2, EP0300348 A2, EP0300348 A2, EP0244029 A1, EP0170332 A1, DE102005050997 A1, DE102005050997 A1, DE10, Forward Citations: WO15032375, WO13181422, US9719062, US9090488, US2013200004, EP3041925,

Abstract:

An upflow reactor is provided that includes a reactor tank, conduits, a waste water distributor, at least one first flotation separator and an optional second flotation separator for separating reactor water, biomass, and biogas, a collection device, and a gas separator for separating biomass and biogas. The first flotation separator includes one or more gas domes that are connected to the collection device and have outlets, the cross-sectional area or geometry of which can be controlled using movable covers.

**13) Family number: 34850881 (US2009211970A)**

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Title:	PROCESS AND REACTOR FOR ANAEROBIC WASTE WATER PURIFICATION			
Priority:	EP20060075015 20060105	EP20070709122 20070105	WO2007NL00002 20070105	
Family:	Publication number	Publication date	Application number	Application date
	CN101370739 A	20090218	CN200780001906	20070105
	CN101370739 B	20130918	CN200780001906	20070105
	DK1984305 T3	20181029	DK20070709122T	20070105
	EP1806324 A1	20070711	EP20060075015	20060105
	EP1984305 A1	20081029	EP20070709122	20070105
	EP1984305 B1	20180725	EP20070709122	20070105
	JP2009522095 T2	20090611	JP20080549438T	20070105
	JP4920700 B2	20120418	JP20080549438T	20070105

KR101330339 B1	20131115	KR20087019136	20070105
KR20080101886 A	20081121	KR20087019136	20070105
PL1984305 T3	20181231	PL20070709122T	20070105
RU2008132148 A	20100210	RU20080132148	20070105
RU2430020 C2	20110927	RU20080132148	20070105
TR201814554 T4	20181022	TR20180014554T	20070105
US2009211970 AA	20090827	US20070159388	20070105
US8021552 BB	20110920	US20070159388	20070105
WO07078194 A1	20070712	WO2007NL00002	20070105

Probable Assignee: BIOTHANE SYSTEMS INT BV

Assignee(s):(std): BIOTHANE SYSTEMS INT BV ; VERSPRILLE ABRAHAM IZAAK ; LA VOS HENDRIK RICHARD PAUL ; VEOLIA UOTER SOL JUSHNZ EHND TEKNOLODZHIZ SEPPORT ; VEOLIA WATER SOLUTIONS AND TECH ; VEOLIA WATER SOLUTIONS AND TECH SUPPORT

Assignee(s): BIOTHANE SYSTEMS INT ; VEOLIA WATER SOLUTIONS TECHNOLOGIES SUPPORT ; VEOLIA WATER SOLUTIONS AND TECHNOLOGIES SUPPORT ; BIOTHANE SYSTEMS INTERNAT B V ; BIOTHANE SYSTEMS INTERNATIONAL B V

Inventor(s):(std): PAUL LA VOS HENDRIK RICHARD ; IZAAK VERSPRILLE ABRAHAM ; VERSPRILLE ABRAHAM IZAAK ; LA VOS KHENDRIK RICHARD PAUL ; LA VOS HENDRIK RICHARD PAUL ; VERSPRILLE ABRAHAM IZAAK

Inventor(s): LA VOS KHENDRIK RICHARD PAUL ; ABRAHAM IZAAK VERSPRILLE ; HENDRIK RICHARD PAUL LA VOS

Agent(s): HATZMANN MARTIN; VO; HANDE MUMCUOGLU; MORRISON AND FOERSTER LLP

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

International class (IPC 8-9): C02F3/28 (Advanced/Invention); C02F3/28 (Core/Invention)

CPC: C12M21/04 C02F1/008 C02F3/2846 C12M23/36 C12M27/20 C12M47/02 Y02E50/343

European class: C02F3/28N C12M21/04 C12M23/36 C12M27/20 C12M47/02 M02F1/00T Y02E50/34B

US class: 210/151 210/151S 210/260 210/603 210/616 210/617

[Classification Explorer](#)

Cited documents: US6309553 BA, KR940014194 A, KR19940014194, JP9248593 A2, JP9248593 A2, JP9220592 A2, JP7308686 A2, JP6254588 A2, JP62114699 A2, JP61174995 A2, JP61111200 A2, JP5337490 A2, JP5123691 A2, JP4341395 A2, JP2253898 A2, JP2169094 A2, JP2006102722 A2, JP2005254029 A2, JP2003326294 A2, JP2003039093 A2, JP2003033793 A2, JP2001269694 A2, JP2000117284 A2, JP1304098 A2, JP1297199 A2, JP11207384 A2, JP10511893 T2, EP1588988 A1, EP1408008 A1, EP1408008 A1, DE3641260 A1,

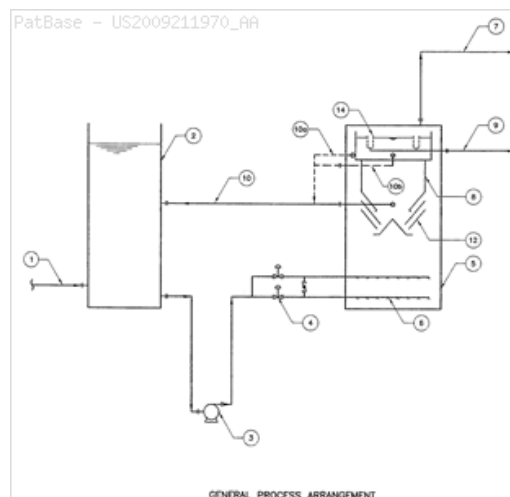
DE102004021022 B3

DE102004021022 B3

Forward Citations: WO19115034, WO13181422, WO12078044, US9090488, US2013126424, KR101779725, JP6091943, JP5801239, JP2015120169, JP2014176790, JP2013208601, JP2008221181, EP3009408, EP3009408, EP2463240, DE202009017869, DE102008017020, CN103288229, CN103288229,

Abstract:

The invention is directed to a process for the anaerobic purification of waste water using a sludge bed system, which process comprises feeding waste water and recycle water to the lower part of an upflow reactor containing mainly granular biomass thus producing biogas in the treatment passing the resulting gas/liquid/solid mixture upward and separating the gas and solid from the liquid in a three phase separator and thereby generating an anaerobic effluent that is withdrawn from the top of the separator, the improvement comprising withdrawing the recycle water separately from the effluent, after the separation of the gas from the liquid, either from the three phase separator or from the top of the reactor outside the three phase separator, and to an upflow reactor suitable for this process.



14) Family number: 61690950 (US2016145550A)

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Title: DEVICE AND METHOD FOR EXTRACTING AROMA SUBSTANCES FROM VEGETABLE AROMA CARRIERS INTO A BREWING LIQUID

Priority: EP20140194031 20141120 DE201510101518 20150203 EP20150190093 20151016

Family:

Publication number	Publication date	Application number	Application date
DE102015101518 B3	20160218	DE201510101518	20150203
DE502015002389 D1	20171228	DE201550002389T	20151016

DK3023485 T3	20180212	DK20150190093T	20151016
EP3023485 A1	20160525	EP20150190093	20151016
EP3023485 B1	20171122	EP20150190093	20151016
ES2656107 T3	20180223	ES20150190093T	20151016
US2016145550 AA	20160526	US20150940911	20151113
US10196594 BB	20190205	US20150940911	20151113

Probable Assignee:	GEA BREWERY SYSTEMS GMBH
Assignee(s):(std):	GEA BREWERY SYSTEMS GMBH
Inventor(s):(std):	MICHEL DR RUDOLF ; SCHELLER DR LUDWIG ; SCHELLER LUDWIG DR ; MICHEL RUDOLF DR ; SCHELLER LUDWIG ; MICHEL RUDOLF ; BAHNS PATRICK
Inventor(s):	BAHNS PATRICK GEA BREWERY SYSTEMS GMBH
Agent(s):	ADVOTEC PATENT U RECHTSANWALTE; ADVOTEC; CARPINTERO MARIO; QUARLES AND BRADY LLP
Designated states:	AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
International class (IPC 8-9):	A23L3/3544 C12C11/11 C12C13/00 C12C3/08 C12C7/20 C12C7/24 C12C7/28 (Advanced/Invention)
CPC:	C12C7/287 C12C3/085 C12C7/205 A23L3/3544 C12C7/24 C12C11/11 C12C13/00
US class:	426/600 99/278
Classification Explorer	
Cited documents:	WO14178711 A1, WO13181422 A1, WO13104911 A2, WO12142988 A1, WO12142988 A1, WO10059211 A2, WO10054712 A1, WO07078195 A1, US7615155 BA, US5976463 A, US4994392 A, US3782551 A, US3407722 A, US3291308 A, US2016083678 AA, US2013202736 AA, US2013126424 AA, US2009285971 AA, US2007039479 AA, EP2500408 A1, EP2388066 A1, EP2206770 A2, EP1106679 A1, EP0508344 A2, EP0011870 A1, DE4111879 A1, DE19960146 A1, DE1442198 A1, DE1442198 A1, DE102013101435 A1 DE102013101435 A1 DE102013004562 A1 DE102013004562 A1 DE102012110830 A1 DE102012110830 A1 DE102010049719 A1
Forward Citations:	WO18177882, WO18083324, ITUB20160882, EP3219781, EP3219781, DE102016121249,

Abstract: A device for extracting aroma substances from vegetable aroma carriers into a brewing liquid, in particular into beer, includes a fluidized bed extractor accommodating a suspension bed including the brewing liquid and solid particles contained in aroma carriers. The fluidized bed extractor has at least an inlet and an outlet for the brewing liquid. A feed pump pumps the brewing liquid from the inlet through the fluidized bed extractor to the outlet. A feeding speed of the feed pump is set to a value at which an average vertical feeding speed of the brewing liquid in the fluidized bed extractor is lower than an average vertical sedimentation speed of the solid particles in the fluidized bed extractor.

