

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO	
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DEP: 2020 DIRECCION DE NUEVAS CREACIONES	EVE: 1 REGISTRO/DEPOSITO/CONCESION/DEPOSITO
TRA: 2 PATENTES DE INVENCION	FOLIOS: 8
ACT: 519 TRASLADOINFORME	

DIRECCIÓN DE NUEVAS CREACIONES

2020
Bogotá, D.C.,

Abogado(a)/Señor(a)
JUAN SEBASTIAN RENGIFO RUBIO

Asunto: Radicación: 13-25761- -25
Trámite: 2
Evento: 1
Actuación: 519
Oficio: 335
Folios: 8

Patente de Invención	X			Patente de Modelo de Utilidad	
Vía Nacional	X				
Vía PCT (Fase Nacional)		Capítulo I		Capítulo II	
No. Solicitud Internacional					
Fecha de Presentación Internacional					

Como resultado del examen de fondo realizado, con fundamento en el Artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se comunica:

1. Documentos estudiados

Descripción:	Rad. N° 13-025761-00000-0000	08/febrero/2013
Reivindicaciones:	Rad. N° 13-025761-00006-0000	07/julio/2014
Dibujos:	Rad. N° 13-025761-00000-0000	08/febrero/2013
Oposiciones:	Rad. N° 13-025761-00003-0000	14/agosto/2013

2. Objeto de la invención

De acuerdo con lo establecido en el numeral 1.2.2.2 del Capítulo Primero del Título X de la Circular Única para efectos del examen de patentabilidad, se tendrá en cuenta la tasa pagada por el solicitante al momento de comenzar el examen para las reivindicaciones adicionales; esto es que cuando la solicitud contenga más de diez (10) reivindicaciones y no se haya pagado la tasa complementaria, sólo se estudiarán las cubiertas por la tasa pagada. Por lo tanto, se estudiarán las reivindicaciones 1 a 6.

Título de la solicitud: “Sistema de Generación de microburbujas para tratamiento de líquidos y/o aguas producidas o residuales”.

El problema planteado en esta solicitud consiste en la necesidad de proporcionar un sistema de tratamiento de aguas residuales industriales o domésticas, con el cual se mejoren los procesos de separación de sólidos y fluidos inmiscibles presentes como contaminantes en el agua a tratar, además de generarse un proceso de despojo de gases contaminantes solubles y de oxigenación, si el gas usado en la flotación es rico en Oxígeno.

Para resolver este problema técnico la solicitud en estudio proporciona un dispositivo primario de inyección de agua, que consiste de un sistema de bombeo de recirculación estándar, un sistema de tuberías de succión y descarga de esta agua al tanque contenedor, un sistema de suministro de gas, preferiblemente desde la cámara de gas del sistema de tanques de contacto en donde se usaran las micro burbujas para hacer la micro flotación, una cámara de succión, que puede ser de una a varias etapas de inyección de agua, la cual por cambios de velocidad asegura la succión de gas, necesario para la generación de las micro burbujas, un sistema de conductos en el cual se asegura el contacto del agua y el gas, un módulo de nucleación en el cual por cambios de velocidad, presión y por efectos de los puntos de nucleación se generan las micro burbujas, y un tanque contenedor en donde se contienen los fluidos requeridos y se realizan los procesos necesario para la generación de las micro burbujas controladas por tamaño y densidad.

El objeto de la presente Solicitud se relaciona con la Clasificación Internacional de Patentes (CIP): B01F 5/00.

3. De la solicitud de patente

Reivindicaciones (Art 30 D 486)

La reivindicación 1 no es clara porque:

- Se reclama que el líquido de alimento de baja presión *“debe ser previamente tratado por sedimentación y/o flotación o estar libre de sólidos y/o líquidos sedimentables o de fácil separación por efecto de la gravedad”*, siendo lo anterior una característica del líquido a tratar y no una característica del sistema de generación de microburbujas reclamado. Por lo tanto, las características del líquido a ser tratado no es materia que se deba comparar con el estado de la técnica para determinar la novedad ni el nivel inventivo de la invención.
- La reivindicación 1 reclama *“fuentes de presión de líquido”* lo cual es una expresión indeterminada que no define la materia que se reclama, debido a que una fuente de presión pueden ser cualquier elemento o mecanismo que genere una presión, luego se está reclamando una característica indefinida. Se reclama también que dicha fuente *“incrementa la presión del líquido de alimento hasta una presión mayor o igual a 1.5 atm”* así como que *“recircula el líquido contenedor en el contacto secundario (11)”*, siendo las anteriores características efectos técnicos que afectan al líquido y no características que definan cómo es la invención. Se sugiere omitir de la materia reclamada dichas características y cambiar la expresión *“fuente de presión”* por *“bomba”*, tal como se revela en la descripción.
- En la reivindicación 2, también se menciona el término *“fuentes de presión”* y se sugiere también sustituirla por al término *“bomba”*. Igualmente, se utiliza el término

“por operar” el cual sugiere una forma de uso del equipo. Se sugiere sustituirlo por el término: “porque tiene...”.

- Con relación a la línea (6) de succión y de conducción de gas, se reclama *que puede ser* presión atmosférica o baja presión. El término “*que puede ser*” hace indefinida la reclamación. Se sugiere evitar utilizar dicho término y en su lugar usar la forma que se enseña en la descripción como: “(6) *una línea de conducción de gas a presión atmosférica o baja presión*”.
- Se reclama que el contacto (11) “*optimiza el contacto de fluidos (líquido y gas) provenientes del sistema de inyección- aceleración de líquido y succión de gas*”. La anterior característica del contacto (11) no es aceptable porque reclama un resultado técnico que se logra con dicho contacto, lo cual no define la invención reclamada. Se sugiere reclamar dicho elemento como ya se había hecho antes al mencionarlo de la forma: “*contacto secundario (11)*”.
- Por otra parte, con relación al elemento de conducción de fluidos (12), se reclama que dicho elemento “*conduce un fluido en fase líquida en estado metaestable de saturación por el gas usado*”. Al respecto, es importante observar que las características del fluido que se conduce no son parte de la invención, no se deben reclamar las características del fluido como parte de la invención, ya que el estado del fluido es el resultado que se logra en el fluido, mediante la invención. Se sugiere evitar reclamar características del estado del fluido.
- Del contacto terciario (13) se reclama que contienen la zona de generación de microburbujas “*por efectos de los fenómenos de nucleación heterogénea, nucleación homogénea, aplicación de fenómenos cortantes y por sobresaturación que además opera como dispersor de presión del fluido*”. No es debido reclamar una característica de la invención por el efecto técnico que produce, ni por la forma en que opera. Se sugiere evitar caracterizar la zona de generación de burbujas del contacto (13) por dichos efectos técnicos o por cómo opera.
- Cabe señalar que las características del líquido o fluido a ser tratado, así como la presión a la que es sometido, no son características que definan la invención, dichas características no son materia que pueda ser comparada con lo perteneciente al estado de la técnica para determinar la novedad o el nivel inventivo del sistema reclamado.
- De lo anterior se concluye que las características que definen el sistema reclamado y que pueden ser comparadas con lo perteneciente al estado de la técnica para determinar la novedad o el nivel inventivo del sistema reivindicado son:

-Un Sistema de generación de microburbujas **que se caracteriza** por comprender (1) una línea de conducción de líquido de alimento de baja presión;

-Una o varias fuentes de presión de líquido;

-Una línea (3) de conducción de líquido proveniente de la bomba (2) (2a);

-Una boquilla (4) que conecta la línea de conducción (3) con el generador de microburbujas (8);

-Un contacto (11) gas-líquido;

-Una línea de conducción de líquido (5) que ingresa al generador de microburbujas por el contacto secundario (11);

-Una línea de succión y conducción de gas de la atmosfera;

-Una válvula (7) de seguridad y/o reguladora de presión;

- Un sistema (8) de inyección y aceleración del líquido y succión de gas, que comprende una o varias etapas;
- Un elemento contenedor (9) en donde se contienen los fluidos requeridos para la generación de las microburbujas;
- Un controlador (10) indicador de nivel de interface liquido gas.

- Con respecto a las reivindicaciones dependientes 3, 4, 6 reclaman resultados a alcanzar, lo cual no es materia que deba ser comparada con lo perteneciente al estado de la técnica.
- Las reivindicaciones 5 y 6 carecen de concisión ya que no ofrece alternativas estructurales al respecto del elemento (13) y solo se enfocan, como se mencionó anteriormente a resultados a alcanzar. Además ya se hizo mención en la reivindicación 1.
- Las reivindicaciones no deben hacer referencia a las figuras, por lo tanto se sugiere evitar la mención de las figuras (3 y 4).

4. Análisis de las Oposiciones

Argumentaciones de Exterran Holdings, Inc.

Dice el opositor que esta solicitud pretende obtener la patente de un dispositivo primario de inyección de agua con las características mencionadas en la solicitud que son: un sistema de bombeo de recirculación estándar, un sistema de tuberías de succión y descarga del agua al tanque contenedor, un sistema de suministro de gas, preferiblemente desde la cámara de gas del sistema de tanques de contacto en donde se usaran las micro burbujas para hacer la micro flotación, una cámara de succión, que puede ser de una a varias etapas de inyección de agua, la cual por cambios de velocidad asegura la succión de gas necesario para la generación de las micro burbujas, un sistema de conductos en el cual se asegura el contacto del agua y el gas, un módulo de nucleación en el cual por cambios de velocidad, presión y por efectos de los puntos de nucleación se generan las micro burbujas, y un tanque contenedor en donde se contienen los fluidos requeridos y se realizan los procesos necesario para la generación de las micro burbujas, controladas por tamaño y densidad, siendo ya conocidas en el estado de la técnica.

El oponente para demostrar la falta de novedad y de nivel inventivo, presenta como pruebas el artículo y los catálogos de sistemas de generación de microburbujas para tratamiento de líquidos y/o aguas, los cuales constituyen el estado del arte más cercano: The Use of Microbubble Flotation Technology in Secondary & Tertiary Produced Water Treatment - A Technical Comparison With Other Séparation Technologies (D1); API Tank Flotation (D2); Proposal for Microbubble Flotation 4-Ch. GFT. (D3); Proposal for Revolift HS Induced Gas Flotation Package (D4); Technical Proposal for Produced Water Treatment Equipment (D5) y la patente WO 2008/147050 (D6).

Respuestas del Solicitante

El solicitante no presentó respuesta a las argumentaciones dadas el 14 de agosto de 2013 por la empresa opositora Exterran Holdings, Inc.

Respuesta del Examinador Técnico

De acuerdo con las pruebas presentadas por la empresa opositora, se determina que son relevantes para el estudio de patentabilidad, debido a que de acuerdo con los documentos presentados, se concluye que es conocido en el estado de la técnica un sistema de generación de micro burbujas para el tratamiento de líquidos y/o aguas residuales para separación de sólidos y demás sustancias contaminantes generadas en un proceso de despojo de gases solubles y de oxigenación, que comprenden: una línea de conducción de agua de alimento, una línea de conducción de agua a presión proveniente de la bomba, un generador de micro burbujas por el sistema de aceleración y/o nucleación, una línea de conducción de gas a presión atmosférica o baja presión, una válvula de seguridad y/o reguladora de presión, un sistema de succión, un tanque contenedor en donde se contienen los fluidos, y una línea de conducción de agua conteniendo micro burbujas.

Por lo tanto, se toma en consideración la patente WO 2008/147050 como el documento D2 (*Ver páginas 90 a 124 del radicado 13-025761-00003-0000*), del 4 de diciembre de 2008, encontrándose que dicho documento afecta el nivel inventivo de la invención, tal como es analizado a continuación en el numeral 5.

5. Determinación del Estado de la Técnica

El estado de la técnica se determinó con base en la fecha de presentación de la solicitud, es decir 08 de febrero de 2013, y se encontraron los siguientes documentos que anticipa el objeto de esta solicitud:

Ítem	Documento	Título	Fecha de Publicación*
D2	WO2008/147050	"Apparatus and method for generating micro bubbles"	04/diciembre/2008
D3	US6054048	"Water purification apparatus"	25/abril/2000

El documento D2¹ divulga un aparato para la generación de una gran cantidad de microburbujas. El aparato para la generación de micro-burbujas incluye: una bomba para la inhalación y la mezcla de un gas y un líquido; una cámara de mezcla para remezclar el gas y el líquido presurizado y alimentado desde la bomba, y una boquilla para la descarga de la mezcla del gas y el líquido, que está formado por remezclar el gas y el líquido en la cámara de mezcla. La cámara de mezcla está provista de una o más particiones, cada una de las cuales está formada con uno o más agujeros, la mezcla del líquido y el gas que fluye a través de los agujeros (Resumen).

El documento D3² enseña un aparato de purificación de agua utilizado para aumentar la concentración de oxígeno en el agua. Dicho aparato incluye una bomba de agua proporcionada en un tanque de agua que produce un flujo de agua, un eyector conectado a la bomba de agua para mezclar el agua con el aire e impulsar el agua mezclada con el aire a su través, un tubo de admisión de aire conectado al eyector para suministrar aire al mismo, y una salida de chorro conectado al eyector, formada con una boquilla de chorro (Resumen).

6. Examen de Patentabilidad (Art 14 D486)

¹ <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2008147050>

² <http://worldwide.espacenet.com/publicationDetails/biblio?CC=US&NR=6054048A&KC=A&FT=D>

Nivel Inventivo (Art 18 D486)

La reivindicación 1 consiste en: “*El Sistema de generación de microburbujas **que se caracteriza por comprender (1) una línea de conducción de líquido de alimento de baja presión la cual debe ser previamente tratada por sedimentación y/o flotación o estar libre de sólidos y/o líquidos sedimentables o de fácil separación por efecto de la gravedad...***” (Ver Radicado 13-025761-00006-0000 del 07 de julio de 2014).

Comparación de las características técnicas esenciales, con las del estado de la técnica:

Características esenciales	D3	D2
Un Sistema de generación de microburbujas que se caracteriza por comprender (1) una línea de conducción de líquido de alimento de baja presión;	El sistema de generación de micro burbujas para el tratamiento de aguas (resumen).	El sistema de generación de micro burbujas para el tratamiento de líquidos y/o aguas residuales (resumen).
-Una o varias fuentes de presión de líquido; -Una línea (3) de conducción de líquido proveniente de la bomba (2) (2a);	-Una bomba (2). -Una línea (13) de conducción de líquido proveniente de la bomba (2) (Col. 3, Lin. 44 a 46; Col. 4, Lin. 6)	-Una bomba (10) -Una línea (12) de conducción de agua de alimento (Figs. 3-6; Párr. 50-77). -Una línea (11) de conducción de agua a presión proveniente de la bomba (10) (Figs. 3-6; Párr. 50-77).
-Una boquilla (4) que conecta la línea de conducción (3) con el generador de microburbujas (8);	-Una boquilla (12) que conecta la línea de conducción (13) con el generador de microburbujas. (Col. 4, Lin. 1 a 2; Fig. 1)	No menciona
-Un contacto (11) gas-líquido;	-Un contacto (4) gas-líquido. (Col. 3, Lin. 48 a 49; Fig. 2)	-Una línea (11) de conducción de agua a presión proveniente de la bomba (10) (Figs. 3-6; Párr. 50-77).
-Una línea de conducción de líquido (5) que ingresa al generador de microburbujas;	-Una línea de conducción de líquido (13) que ingresa al generador de microburbujas. (Col. 4, Lin. 4 a 6; Fig. 1)	No menciona.
-Una línea de succión y conducción de gas de la atmosfera;	-Una línea (5) de succión y conducción de gas de la atmosfera. (Col. 4, Lin. 7 a 8; Fig. 1)	-Sistema de succión (bomba 2) (Figs. 3-6; Párr. 50-77).
-Una válvula (7) de seguridad y/o reguladora de presión;	No menciona.	-Una válvula (14, 16) de seguridad y/o reguladora de presión (Figs. 3-6; Párr. 50-77).
-Un sistema (8) de inyección y aceleración del líquido y succión de gas, que comprende una o varias etapa;	-Un sistema (5)-(11) de inyección y aceleración del líquido y succión de gas, que comprende una o varias etapas. (Col. 3, Lin. 66 a 67; Fig. 2)	No menciona.
-Un elemento contenedor (9) en donde se contienen los fluidos requeridos para la generación de las microburbujas;	-Un elemento contenedor (3) en donde se contienen los fluidos requeridos para la generación de las microburbujas; (Col. 3, Lin. 44 a 46; Fig. 1)	-Tanque (20) contenedor en donde se contienen los fluidos (Figs. 3-6; Párr. 50-77).
-Un controlador (10) indicador de nivel de interface liquido gas.	No menciona	-Un controlador (18) indicador del nivel de gas. (Fig. 7; Párr. 84).

Los documentos D2 y D3 se consideran el estado de la técnica cercano a la invención definida en la reivindicación 1, porque D2 divulga un aparato para la generación de una gran cantidad de microburbujas (Fl. 1 Resumen), y D3 un aparato para la generación de

microburbujas el cual usa aire de la atmosfera como gas para la creación de las microburbujas (FI 1, Resumen).

La diferencia entre la invención, definida en la reivindicación 1 y el aparato de purificación de agua revelado en el documento D3, consiste en que D3 no divulga una válvula de seguridad reguladora de presión ni un controlador indicador de nivel de interface liquido gas.

La diferencia entre la invención, definida en la reivindicación 1 y el equipo de tratamiento de aguas revelado en el documento D2, consiste en que D2 no divulga un sistema de inyección y aceleración del líquido y succión de gas, que comprenda una o varias etapas.

El efecto que logra el incluir una válvula de seguridad reguladora de presión y un controlador indicador de nivel de interface líquido gas es controlar y lograr las condiciones de operación requeridas para el buen funcionamiento del equipo.

Por lo tanto, el problema técnico objetivo que pretende resolver esta invención se puede formular así: ¿cómo modificar el equipo de generación de microburbujas conocido en D3 para obtener una mayor eficiencia en la producción de las microburbujas controlando la presión y el nivel de interface líquido gas?

Sin embargo, solucionar el problema técnico planteado incluyendo una válvula de seguridad reguladora de presión y un controlador indicador de nivel de interface liquido gas, ya está divulgado en el documento D2 que se refiere a un aparato para la generación de una gran cantidad de microburbujas, el cual divulga la utilización en dicho equipo de una válvula (14, 16) de seguridad y/o reguladora de presión (Figs. 3-6; Párr. 50-77), y un controlador (18) indicador del nivel de gas (Fig. 7; Párr. 84).

En consecuencia, la persona del oficio normalmente versada en la materia, incluiría la válvula de seguridad y/o reguladora de presión, así como el controlador indicador del nivel de gas divulgados en el documento D2 en el aparato revelado en D3 para llegar así al objeto de la reivindicación 1 de la solicitud. Por lo cual se considera obvia.

Asimismo, el documento D2 divulga las características de las reivindicaciones dependientes así:

- Reivindicación 2. Sistema de generación de micro burbujas que opera con una sola fuente de presión (10) (D2: Fig. 3; Pár. 50).
- Reivindicación 5. Contactor de placas (D2: Fig. 4; Párr. 58, 60, 64).

Por lo anterior, dichas reivindicaciones dependientes 2 y 5 no proporcionan al objeto de la reivindicación independiente 1 ningún efecto sorprendente, y en consecuencia no tienen nivel inventivo.

7. Conclusión

Los requisitos de Patentabilidad de la presente solicitud están afectados así:

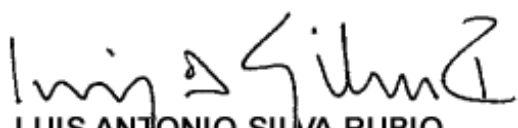
Ítem	Documento	Reivindicaciones afectadas	Requisito que afecta
D2	WO2008/147050	1, 2, 5	Nivel Inventivo
D3	US6054048	1, 2, 5	Nivel Inventivo

En cumplimiento del artículo 45 de la Decisión 486 de la Comisión de la Comunidad Andina, se le indica que debe dar respuesta dentro del término de sesenta (60) días contados a partir del día siguiente de la fecha de notificación de la presente comunicación. En caso de no dar respuesta al presente requerimiento, o si a pesar de la respuesta subsistieran los impedimentos para la concesión, se denegará la patente.

Se invita al solicitante se sirva indicar, si así lo considera, su renuncia al término faltante de sesenta (60) días para dar respuesta a este requerimiento y presentarla por escrito.

Finalmente, se le recuerda al solicitante que si como respuesta a este requerimiento llegara a modificar el capítulo reivindicatorio y éste contenga más de diez (10) reivindicaciones, no pagará la tasa de modificación voluntaria pero sí la correspondiente al pago por reivindicación adicional.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única No. 10 de 2001.



LUIS ANTONIO SILVA RUBIO
Director de Nuevas Creaciones (e)

El anterior requerimiento fue notificado por fijación en lista, de fecha 2016-01-26

Elaboró: Jesus Alejandro Velasquez Salgado
Revisó: Rachid Ponce Vergel

Search history

Search 1: PN=(RU2318796) (Results 1)

Search 2: PN=(WO2013057126) (Results 1)

Search 3: [SP]: 1. a process comprising subjecting a liquid feed comprising monochloroacetic acid and dichloroacetic acid to a catalytic hydrodechlorination step by contacting it with a source of hydrogen to convert the dichloroacetic acid into monochloroacetic acid in the presence of a solid heterogeneous hydrogenation catalyst comprising one or more metals of group viii of the periodic table of the elements deposited on a carrier, wherein said catalytic hydrodechlorination step is carried out in a vertical tubular reactor with a diameter exceeding 0.4 m, with the solid heterogeneous hydrogenation catalyst being situated in a fixed catalyst bed, wherein the liquid feed is fed to the top of said vertical tubular reactor at a superficial mass velocity of between 1 and 10 kg/s per square meter of the horizontal cross-section of the vertical tubular reactor and a rate of between 250 and 3,000 kg/hr per m³ of said catalyst bed, wherein the source of hydrogen is fed to the top or bottom of the vertical tubular reactor at a superficial gas velocity of between 0.025 to 0.25 nm³/s per square meter of the horizontal cross-section of the vertical tubular reactor, so as to obtain an average axial pressure gradient of at least 2 kpa per meter of said catalyst bed, and wherein the temperature in the top of the vertical tubular reactor is between 100 and 200 degrees centigrade, and wherein the pressure in the top of the vertical tubular reactor is between 0.2 and 1.0 mpa. 2. the process according to claim 1 wherein the liquid feed fed to the top of said vertical tubular reactor comprises at least 5.5 percent by weight acetic acid. 3. the process according to claim 1 wherein the fixed catalyst bed in which the heterogeneous hydrogenation catalyst is situated has been prepared by loading the vertical tubular reactor with the heterogeneous hydrogenation catalyst using a dense loading technique. 4. the process according to claim 1 wherein the liquid feed is fed to the top of said vertical tubular reactor at a superficial mass velocity of between 2.5 and 6 kg/s per square meter of the horizontal cross-section of the vertical tubular reactor. 5. the process according to claim 1 wherein the heterogeneous hydrogenation catalyst comprises between 0.1 and 3 percent by weight, based on the total weight of the heterogeneous hydrogenation catalyst, of the one or more metals of group viii of the periodic table of the elements. 6. the process according to claim 1 wherein the carrier is selected from the group consisting of activated carbon, silica, alumina, zirconium oxide, and titanium oxide. 7. the process according to claim 6, wherein the carrier is in the form of particles, said particles being in the form of irregularly shaped granules, spheres, rings, trilobes, quadrulobes, or extrudates. 8. the process according to claim 7 wherein the particles are in the form of extrudates, trilobes, or quadrulobes, and wherein said extrudates, trilobes or quadrulobes have a diameter of between 0.8 and 3 mm and a length of between 1 and 10 mm. 9. the process according to claim 1 wherein the heterogeneous hydrogenation catalyst comprises at least one of palladium and platinum. 10. the process according to claim 1 wherein the temperature in the top of the vertical tubular reactor is between 145 and 175 degrees centigrade. 11. the process according to claim 1 wherein the source of hydrogen is fed to the top of the vertical tubular reactor, resulting in a co-current downflow with the liquid feed. 12. the process according to claim 11 wherein the pressure in the top of the vertical tubular reactor is between 0.3 and 0.6 mpa. 13. the process according to claim 1 wherein the source of hydrogen is fed to the bottom of the vertical tubular reactor and the pressure at the bottom of the vertical tubular reactor is between 0.3 and 0.6 mpa. 14. the process according to claim 1 wherein the liquid feed subjected to the catalytic hydrodechlorination step comprises (i) between 60 and 99.5 percent by weight of monochloroacetic acid, (ii) between 0.05 and 20 percent by weight of dichloroacetic acid, (iii) between 0 and 30 percent by weight of acetic acid, (iv) between 0.1 and 5 percent by weight of water, and (v) between 0 and 5 percent by weight of other components, up to a total of 100 percent, based on the total weight of the liquid feed. 15. the process according to claim 3 wherein the liquid feed is fed to the top of said vertical tubular reactor at a superficial mass velocity of between 2.5 and 6 kg/s per square meter of the horizontal cross-section of the vertical tubular reactor. 16. the process according to claim 4 wherein the heterogeneous hydrogenation catalyst comprises between 0.1 and 3 percent by weight, based on the total weight of the heterogeneous hydrogenation catalyst, of the one or more metals of group viii of the periodic table of the elements. 17. the process according to claim 5 wherein the carrier is selected from the group consisting of activated carbon, silica, alumina, zirconium oxide, and titanium oxide. 18. the process according to claim 3 wherein the temperature in the top of the vertical tubular reactor is between 145 and 175 degrees centigrade. 19. the process according to claim 5 wherein the source of hydrogen is fed to the top of the vertical tubular reactor, resulting in a co-current downflow with the liquid feed. 20. the process according to claim 9 wherein the source of hydrogen is fed to the bottom of the vertical tubular reactor and the pressure at the bottom of the vertical tubular reactor is between 0.3 and 0.6 mpa. (Results 537)

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Search 5: FT=(microbubble and generator and tank and at and atmospheric and pressure) (Results 175)

Search 6: FT=(microbubble generator tank at atmospheric pressure for water treatment) (Results 0)

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Search 12: DSC=(microbubbles atmospheric pressure tank) (Results 0)

Search 13: DSC=(microbubbles and atmospheric and pressure and tank) (Results 606)

Search 14: DSC=(Water and purification and apparatus and microbubbles and tank and atmospheric and pressure and tubes) (Results 110)

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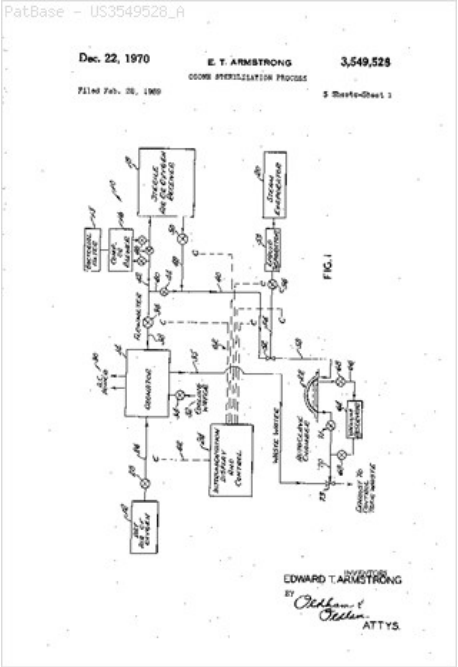
Title: OZONE STERILIZATION PROCESS

Abstract: Source: US3549528A ABSTRACT OF THE DISCLOSURE

A unique utilization of oxygen and ozone generated from oxygen in a gaseous form singly or in combination as from air, or a carbon dioxide-oxygen mixture used as 15 a solution or with superheated **water** vapor is contemplated in process and **apparatus**. A sterilant is made by passing a fluid in a flow dominated by a hydraulic pressure gradient characterized by an overall pressure drop per unit of line length reduced from the gravitational 20 gradient pressure drop per unit of line length of one foot of fluid per foot of distance by several orders of magnitude, substantially uninfluenced by the gravitational pressure gradient incidentally present creating local areas of high momentum exchange at restrictions in the flow, and 25 introducing gaseous oxygen-ozone into the liquid at these points where the static pressure is regained thus modifying the velocity profile in fully developed turbulent flow to achieve maximum uniformity of oxygen-ozone concentration throughout the fluid whereby the solubility 30 of the oxygen-ozone into the fluid is greatly enhanced. Further, this process may also be operated at a reduced incident gas content in the fluid and possibly at a temperature reduced to increase the solubility of oxygen-ozone, and sterilization within the fluid conduit or con- 35 tainer takes place during a distance in which the hydraulic pressure gradient is continuously imposed to ensure maximum solubility of the oxygen-ozone into the fluid by reason of intense mixing and restricted pressure change.

Classifications:

International (IPC 8-9): A47K10/06 A47K10/30 A61L11/00 A61L2/16 A61L2/20 B01D21/00 B01D21/02 B01D21/34 B01D47/00 B01D53/34 B01F11/00 B01F3/04 B01F5/04 B01F5/06 B01J10/00 B01J12/00 C01B13/10 C01B13/11 C02F1/24 C02F1/34 C02F1/36 C02F1/48 C02F1/72 C02F1/74 C02F1/76 C02F1/78 C02F11/00 C02F11/06 C02F3/00 C02F3/02 C02F3/04 C02F3/10 C02F3/12 C02F3/14 C02F3/20 C02F3/26 C02F3/30 C02F3/34 C02F7/00 C02F9/00 F16L55/00 F16L55/02 F16L55/045 (Advanced/Invention); C02F1/76 C02F1/78 F16L55/00 (Advanced/Non-invention); A47K10/00 A47K10/24 A61L11/00 A61L2/16 A61L2/20 B01D21/00 B01D21/02 B01D21/30 B01D47/00 B01D53/34 B01F11/00 B01F3/04 B01F5/04 B01F5/06 C01B13/10 C01B13/11 C02F1/24 C02F1/34 C02F1/48 C02F1/72 C02F1/74 C02F1/76 C02F1/78 C02F11/00 C02F11/06 C02F3/00 C02F3/02 C02F3/04 C02F3/10 C02F3/12 C02F3/14 C02F3/20 C02F3/26 C02F3/30 C02F3/34 C02F7/00 C02F9/00 F16L55/00 F16L55/02 F16L55/04 (Core/Invention); C02F1/76 C02F1/78 (Core/Non-invention)
International (IPC 1-7): A61L13/06 B01D21/02 B01D21/24 B01D53/14 B01F11/00 B01F3/04 B01F5/04 B01J11/00 B01J14/00 B01J10/00 B05B3/06 C01B13/10 C01B13/11 C02B1/34 C02B1/36 C02B1/38 C02B3/06 C02B3/08 C02C1/00 C02C1/02 C02C1/04 C02C1/06 C02C1/08 C02C1/26 C02C1/40 C02C5/00 C02C5/04 C02F3/14 C02F7/00 F15D1/02 F16F15/00 F16K19/00 F16L55/00 F16L55/04 F17D1/20
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European: A47K10/06 A47K10/30 A61L11/00 A61L2/16 A61L2/20 A61L2/20C B01D21/00 B01D21/01 B01D21/14 B01D21/24 B01D47/00 B01D53/34 B01F11/02B B01F5/04C13B B01F5/06F C01B13/10 C01B13/11 C02F1/24 C02F1/34 C02F1/36 C02F1/48 C02F1/72 C02F1/78 C02F3/00R C02F3/02 C02F3/04 C02F3/04C C02F3/12A2 C02F3/12V2 C02F3/12V6 C02F3/20 C02F3/26 C02F3/30 C02F3/30D C02F3/34 C02F9/00 F16L55/02 F16L55/045 M01B201/66 M02F1/76 M02F1/78 M02F307/08
US: 137/207 137/604 137/888 138/115 210/0.6 210/151 210/19.5 210/192 210/194 210/195.1 210/195.3 210/199 210/202 210/203 210/220 210/273 210/519 210/60 210/61 210/614 210/615 210/622 210/625 210/629 210/631 210/752 210/756 210/758 210/760 210/764 210/765 210/96.2 219/342 219/385 219/521 219/541 239/254 239/550 248/214 248/317 261/116 261/76 261/78.2 34/239 392/436 422/186.14 422/186.2 422/28 422/39 423/210 423/659 423/DIG.17 423/DIG.9 55/9.3 588/900



Family:

Publication number	Publication date	Application number	Application date
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Priority:

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US19780898484	19780425				

Probable Assignee: TII CORP

Assignee(s): (std): ARMSTRONG EDWARD ; ARMSTRONG EDWARD T ; TEREKOMYUUNIKEISHONZU IND INC ; GRAHAM J ; T11 CORP ; ARMSTRONG E ; ARMSTRONG E T ; TELECOMMUNICATIONS IND INC ; TELECOMM IND INC ; TELECOMMUNICATIONS IND ; TII CORP ; TII CORP TELECOMMUNICATIONS IN

Assignee(s): TII CORP TELECOMMUNICATIONS IND INC ; TIL CORP ; EDWARD T ARMSTRONG ; ARMSTRONG E US ; KEY WEST HOLDINGS INC ; GRAHAM J US

Inventor(s): (std): ARMSTRONG E ; ARMSTRONG EDWARD T ; EDOWAADO TEI AAMUSUTORONGU ; GRAHAM J

Inventor(s): T ARMSTRONG EDWARD ; GRAHAM J US ; ARMSTRONG E US ; EDWARD T ARMSTRONG

Agent(s): RIDOUT AND MAYBEE LLP

Title: METHOD AND APPARATUS FOR THE PURIFICATION OF AQUEOUS EFFLUENT

Abstract: Source: US3910838A A method and apparatus for purifying aqueous effluent in which effluent is passed into a mixing tank to be oxygenated with pure oxygen or an oxygen mixture, e.g., air. The oxygenation can be effected by use of a rotary surface aerator or by passing the effluent along a sinuous flow path and contacting effluent in the flow path with the oxygen.

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 C02F3/12 C02F3/16

C02F3/26 (Advanced/Invention);

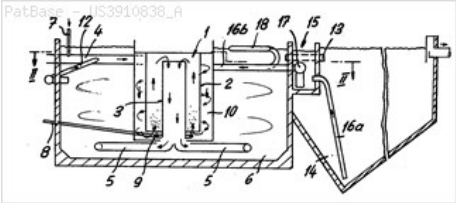
B01F3/04 C02F1/74 C02F3/12 C02F3/14 C02F3/26 (Core/Invention)

International (IPC 1-7): C02C1/06 C02C1/08 C02C1/10 C02F3/12 C02F3/22

CPC: Y02W10/15 C02F3/12 B01F3/04099 C02F3/16 C02F3/26

European: B01F3/04C C02F3/12 C02F3/16 C02F3/26

US: 210/195.3 210/197 210/205 210/627 210/629 210/7 261/123 261/77 261/91



Family:

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DE2300157 A1	19740117	DE19732300157	19730103
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NL7309015 A	19740104	NL19730009015	19730628
PL90078 P	19761231	PL19730163791	19730702
US3910838 A	19751007	US19730374959	19730629
ZA7304442 A	19740626	ZA19730004442	19730629

Priority:

CH19720009909 19720702

Probable Assignee: Kaelin J R

Assignee(s): (std): Kaelin J R

Assignee(s): Kaelin Joseph CH ; Kaelin Joseph R ; Kaelin Joseph Richard ; Kaelin Joseph Richard Buochs Schweiz ; Kaelin Joseph R Villa Seeburg 6374 Buochs Suisse ; Kaelin ; Kaelin J

Inventor(s): (std): Kaelin J ; Kaelin Joseph Richard

Inventor(s): Kaelin Joseph Richard Buochs Schweiz

Title: TREATMENT OF A LIQUID BY CIRCULATION AND GAS CONTACTING

Abstract: Source: US4278546A Process and **apparatus** for treating waste **water** by circulating it, together with oxygen-containing gas, through communicating downflow and upflow pipes enclosed in a treatment chamber, the pipes being open at their bottom ends, and controlling the flow of waste **water**/gas mixture from the downflow pipe to cause gas bubbles to escape downwardly, or part downwardly and part upwardly, in the treatment chamber.

Classifications:

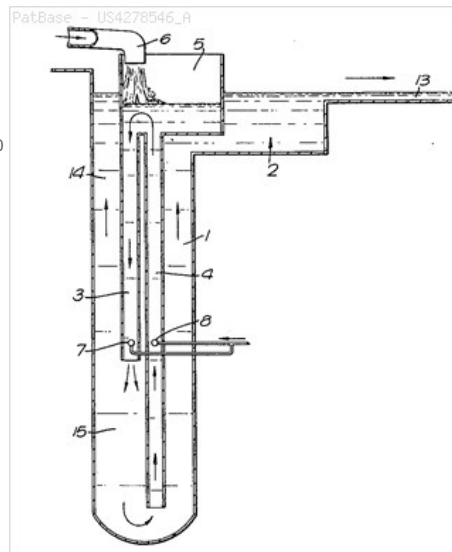
International (IPC 8-9): B01D3/16 B01F13/02 B01F3/04 B01J10/00 C02F3/12 C02F3/22 C02F3/24 (Advanced/Invention); B01F5/10 (Advanced/Non-invention); B01D3/14 B01F13/00 B01F3/04 B01J10/00 C02F3/12 C02F3/22 C02F3/24 (Core/Invention); B01F5/00 (Core/Non-invention)

International (IPC 1-7): B01F13/00 B01F13/02 B01F3/04 B01F5/04 B01F5/10 B01J10/00 B01J10/00 C02C1/02 C02C1/06 C02C1/08 C02C5/00 C02C5/02 C02C5/04 C02C5/10 C02F1/52 C02F1/72 C02F1/74 C02F3/00 C02F3/20 C02F3/22

CPC: Y02W10/15 C02F3/1294 B01F3/0451 B01F3/0473 B01F3/04744 B01F5/10 B01F13/02 C02F3/223 C02F3/226 C02F3/24

European: B01F13/02 B01F3/04C4G2 B01F3/04C6 B01F3/04C6A2 C02F3/12M C02F3/12V6 C02F3/22C C02F3/22D C02F3/24 L01F5/10

US: 210/195.3 210/199 210/220 210/626 210/629 210/750 210/752 261/36.1 261/77

**Family:**

Publication number	Publication date	Application number	Application date
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SU776555 D	19801030	SU19762415357	19761102
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Priority:

GB19750043362 19751022 GB19760014098 19760407 GB19760043362 19761015
US19760733410 19761018 CA19760264147 19761022

Probable Assignee: ICI LTD**Assignee(s):** (std): ICI LTD ; ICI PLC

Assignee(s): IMP CHEM IND LTD ; IMP CHEMICAL IND GB LTD ; IMP CHEMICAL IND LTD ; IMP CHEMICAL IND LTD GB ; IMP CHEMICAL IND LTD TE LONDON ; IMP CHEMICAL IND PLC ; IMPERIAL CHEM IND LTD ; IMPERIAL CHEMICAL INDUSTRIES PLC ; IMPERIAL CHEMICAL INDUSTRIES LIMITED GB ; IMPERIAL CHEMICAL INDUSTRIES LIMITED ; IMPERIAL CHEMICAL INDUSTRIES LTD ; IMPERIAL CHEMICAL INDUSTRIES LTD GB ; IMPERIAL CHEMICAL INDUSTRIES LTD TE LONDON ; ROESLER FRANK C DECEASED

Inventor(s): (std): CORNELIUS ROESLER FRANK ; F C ROESLER ; FC ROESLER ; FRANK CORNELIUS ROESLER ; FRENK KORNELIUS ROESLER GB ; FURANKU KOONERIVUUSU ROOSURAA ; ROESLER DECEASED FRANK C ; ROESLER F ; ROESLER F C ; ROESLER FRANK C ; ROESLER FRANK C DECEASED ; ROESLER FRANK CORNELIUS ; ROESLER FRENK KORNELIUS

Agent(s): BALLANTYNE DONALD G

Title: VERFAHREN ZUR BIOLOGISCHEN REINIGUNG VON ABWASSER BIOLOGICAL SEWAGE TREATMENT - USING SURFACE AERATOR RECEIVING RECYCLED IMPELLER SPRAY DROPLETS

Abstract: Source: DE3039423A1 Verfahren zur biologischen Reinigung von Abwasser Patentanspruch 1 Verfahren zum biologischen Reinigen von Abwasser unter Verwendung von mindestens einem in einem Kreislaufbecken arbeitenden horizontalachsigen Oberflächenbelüfter, dadurch gekennzeichnet, dass mindestens ein Teil des Abwassers im freien Fall auf den aufwärts bewegten Umfangsteil des Oberflächenbelüfters gegeben wird. 2. System for the biological treatment of sewage uses at least one partly submerged surface aerator with a horizontal drive shaft in a basin with a forced circulation. At least a part of the sewage is allowed to drop in a free fall on the upward moving peripheral part of the surface aerator. At least a part of this side stream is the liquid, which is slung up by the impeller and has been collected in a gutter. This has a better efficiency because of an optimum intake of oxygen.

Classifications:

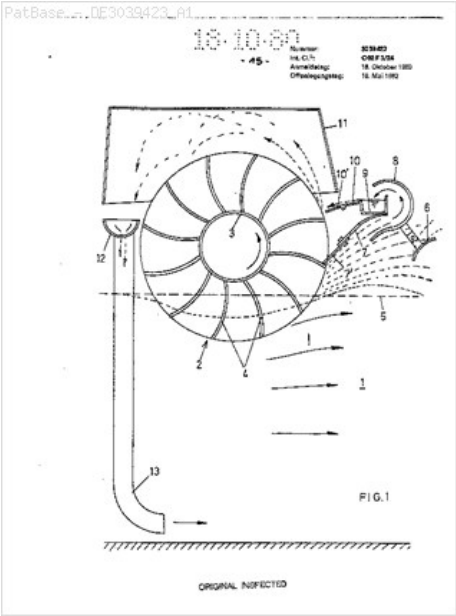
International (IPC 8-9): B01F3/04 C02F3/18 C02F3/24 (Advanced/Invention);

B01F3/04 C02F3/14 C02F3/24 (Core/Invention)

International (IPC 1-7): C02F1/74 C02F3/24

CPC: Y02W10/33 C02F3/24 B01F3/04765 C02F3/18 Y02W10/15

European: B01F3/04C6C C02F3/18 C02F3/24



Family:

Publication number	Publication date	Application number	Application date
DE3039423 A1	19820519	DE19803039423	19801018
DE3039423 C2	19850404	DE19803039423	19801018

Priority:

DE19803039423 19801018

Probable Assignee: SCHRAMM PAUL

Assignee(s): (std): SCHRAMM PAUL

Assignee(s): SCHRAMM PAUL 6209 AARBERGEN DE

Inventor(s): (std): SCHRAMM PAUL

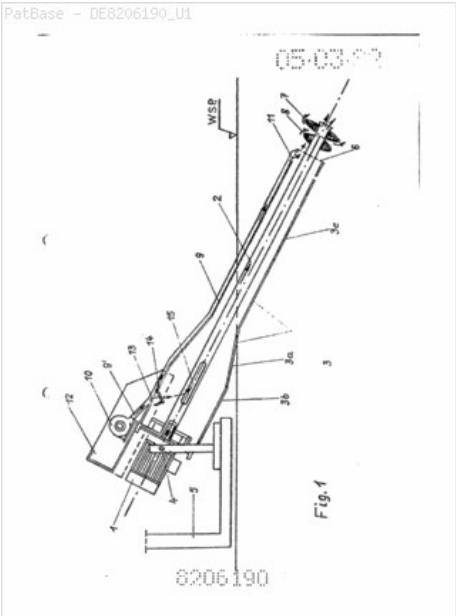
Inventor(s): SCHRAMM PAUL 6209 AARBERGEN DE

Title: VORRICHTUNG ZUR BEGASUNG ODER BELUEFTUNG UND/ODER UMWAEELZUNG VON BZW. ERZEUGUNG VON STROEMUNGEN IN FLUESSIGKEITEN DEVICE FOR fumigation or ventilation and / or circulation of OR GENERATING vibrations in liquids (Machine translation)

Abstract: Source: DE8206190U1 (Claim 1) Vorrichtung zur Begasung oder Belueftung und/oder Umwaelzung von bzw. Erzeugung von Stroemungen in Fluessigkeiten Schutzansprueche 1. Vorrichtung zur Begasung oder Belueftung und/oder Um- waelzung von bzw. Erzeugung von Stroemungen @n Fluessig- keiten, insbesondere in Belebungsbecken zur bio- logischen Reinigung von Abwaessern, mit wenigstens -ens einer durch wenigstens ein Antriebsaggregat antreibbaren Hohlwelle, an deren freiem, in die Fluessigkeit eintauchenden Ende wenigstens ein Propeller angeordnet ist, durch dessen Steigung in Fortsetzungs- richtung der Hohlwelle eine Stroemung erzeugbar und bei gleichzeitiger Begasung das eingetragene Gas (beispielsweise Luft) feinblasig verteilbar ist, und in deren anderem, dem Antriebsaggregat zugewandten Endabschnitt wenigstens eine Gas-bzw.

Machine translation: (Claim 1) device for fumigation or aeration and / or circulation of currents in liquids or generation of Schutzansprueche first **Apparatus** for fumigation or aeration and / or order-electrolyte circulation liquids from or generation of currents @ n, especially in the aeration tank for biological **purification** of waste **waters**, with least-ens a drivable by at least one drive unit hollow shaft, open at the, into the liquid immersed end of at least one propeller is arranged, produced by the gradient in continuation direction of the hollow shaft, a flow and simultaneous fumigation of a registered gas (eg air) is small bubbles distributed, and in their other, the drive assembly end portion facing at least one gas -or.

Classifications:
International (IPC 8-9): B01F3/04 B01F5/10 B01J10/00 C02F1/74 C02F11/02 C02F3/14 C02F7/00 (Advanced/Invention); B01F3/04 B01F5/00 B01J10/00 C02F1/74 C02F11/02 C02F3/14 C02F7/00 (Core/Invention)
International (IPC 1-7): B01F3/04 B01F5/10 B01J10/00 C02F1/74 C02F11/02 C02F3/14 C02F7/00
CPC: Y02W10/27 Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
DE8206190 U1	19820722	DE19820006190U	19820305

Priority:
DE19820006190U 19820305

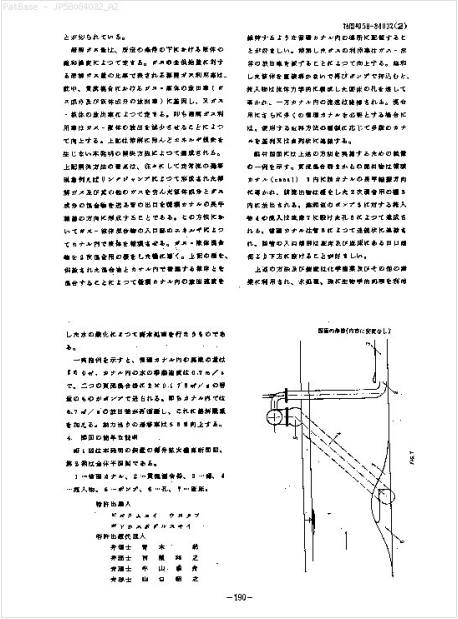
Probable Assignee: LIND HELGA 7140 LUDWIGSBURG DE
Assignee(s): LIND HELGA 7140 LUDWIGSBURG DE

Title: METHOD AND APPARATUS FOR ENHANCING UTILIZATION RATIO OF GAS DISSOLVED IN LIQUID

Abstract: Source: DE3231563A1 The area of application of the invention is in the chemical industry, food industry and other industries, **water purification** and mainly wastewater treatment. According to the invention, the utilisation factor of gas dissolved in liquid can be increased by feeding a mixture of liquid and gaseous components into a secondary mixture in a covered duct which is preferably disposed in a circulation channel, achieving an increase in the utilisation factor for the dissolved gas while maintaining the flow velocities in the circulation channel which are induced in the direction of the longitudinal axis by the energy of the outflowing mixture, while at the same time the gas/liquid output ratio is reduced and the output of the liquid component is increased.

Classifications:

International (IPC 8-9): B01F1/00 B01F3/04 B01F5/04 B01F5/10 C02F3/12 C02F3/22 (Advanced/Invention); B01F1/00 B01F3/04 B01F5/00 B01F5/04 C02F3/12 C02F3/22 (Core/Invention)
International (IPC 1-7): B01F1/00 B01F3/04 B01F5/04 B01F5/10 B01J10/00 C02F1/74 C02F3/02 C02F3/20 C02F3/22
CPC: Y02W10/15 C02F3/1257 B01F3/04099 B01F5/04 B01F5/102 C02F3/1294
European: B01F3/04C B01F5/04 B01F5/10B C02F3/12N6 C02F3/12V6



Family:

Publication number	Publication date	Application number	Application date
CA1191287 A1	19850730	CA19820409990	19820824
CS223313 B1	19830915	CS19810006345	19810825
DE3231563 A1	19830310	DE19823231563	19820825
DE3231563 C2	19880609	DE19823231563	19820825
JP2034649 B4	19900806	JP19820146298	19820825
JP58084032 A2	19830520	JP19820146298	19820825

Priority:

CS19810006345 19810825 CA19820409990 19820824

Probable Assignee: VYZK USTAV VODOHOSPODARSKY

Assignee(s): (std): BIZUKUMUNI USUTAFU BUODOHOSUPO ; VYZK USTAV VODOHOSPODARSKY ; VYZKUMNY USTAV VODOHOSPODARSKY ; HAINDL KAREL

Assignee(s): HAINDL KAREL CS ; BIZUKUMUNI USUTAFU BUODOHOSUPODARUSUKII BUI PURAZE ; BIZUKUMUNII USUTAFU BODOHOSUHODARUSUKII ; VYZKUMNY USTAV VODOHOSPODARSKY PRAG PRAHA CS ; VYZKUMNY USTAV VODOHOSPODARSKY PRAHA CS

Inventor(s): (std): HAINDL KAREL ; HAINDL KAREL DIPL ING DR ; KARELU HAINDORU

Inventor(s): HAINDL KAREL CS ; HAINDL KAREL DIPL ING DR S C ; HAINDL KAREL DIPL ING DR S C PRAHA CS ; HAINDL KAREL DIPL ING DRSC ; HAINDL KAREL DIPL INGDRSC

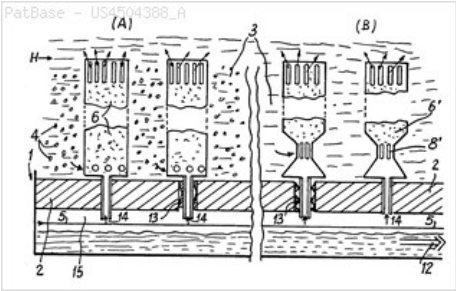
Agent(s): ROBIC ROBIC AND ASSOCIES ASSOCIATES

Title: REACTOR FOR INJECTION OF GAS INTO A LIQUID

Abstract: Source: US4504388A Reactor having considerable volume or surface for injection and distribution of a gaseous fluid into a liquid mass to be treated, includes a false bottom having over its entire surface a series of nozzles each having a small orifice, incorporated with a pipe, immersed in the liquid, whose perforated base rests on the false bottom and whose closed upper end is provided with slots from which gas bubbles escape into an active zone of the liquid mass.

Classifications:

International (IPC 8-9): B01F15/00 B01F3/04 B01F3/08 B01F5/04 B01J10/00 B01J4/00 B01J8/00 B01J8/22 C02F3/06 C02F3/12 C02F3/22 (Advanced/Invention); B01F15/00 B01F5/04 B01J10/00 (Advanced/Non-invention); B01F3/04 B01F3/08 B01J10/00 B01J4/00 B01J8/00 B01J8/20 C02F3/06 C02F3/12 C02F3/22 (Core/Invention); B01F15/00 B01F5/04 (Core/Non-invention)
International (IPC 1-7): B01F13/00 B01F13/00 B01F3/04 B01F3/04 B01F5/00 B01F5/06 B01J10/00 B01J19/00 B01J19/26 B01J8/22 C02F1/74 C02F3/02 C02F3/06 C02F3/12
CPC: Y02W10/15 C02F3/223 B01F3/04248 B01F3/04517 B01F3/0876 B01F5/0413 B01F15/005 B01F15/00525 B01J8/008 C02F3/06 C02F3/1226
European: B01F15/00L8E B01F3/04C1B2F B01F3/04C4G2B B01F3/08F4 B01J8/00L C02F3/06 C02F3/12A8 C02F3/22C L01F15/00L8B L01F5/04C12
US: 210/130 210/221.2 261/123 261/77



Family:

Publication number	Publication date	Application number	Application date
AU198315650 A1	19831222	AU19830015650	19830609
DE3321436 A1	19831215	DE19833321436	19830614
ES523012 A1	19840316	ES19830523012	19830606
ES8403039 A1	19840601	ES19830523012	19830606
FR2528324 A1	19831216	FR19820010290	19820614
FR2528324 B3	19850322	FR19820010290	19820614
IT1163503 A	19870408	IT19830021576	19830613
IT8321576 A0	19830613	IT19830021576	19830613
JP1721975 C3	19921224	JP19830103505	19830609
JP4006416 B4	19920205	JP19830103505	19830609
JP59052525 A2	19840327	JP19830103505	19830609
SE8303088 A	19831215	SE19830003088	19830601
SE8303088 A0	19830601	SE19830003088	19830601
SE8303088 L	19831215	SE19830003088	19830601
US4504388 A	19850312	US19830503902	19830613

Priority:

FR19820010290 19820614

Probable Assignee: OMNIUM TRAITEMENT VALORISATION

Assignee(s): (std): OTV OMNIUM DE TRAITEMENT ET DE ; OO TE UE OMUNION DO TORETOMAN ; OMNIUM TRAITEMENT VALORISA ; OMNIUM TRAITEMENT VALORISATION ; OO TE BUE OMUNION DOU TORETOMA ; O T V OMNIUM DE TRAITEMENT ET

Assignee(s): O T V OMNIUM DE TRAITEMENT ET DE VALORISATION ; O T V ; OO TE BUE OMUNION DOU TORETOMAN E DOU BUARORIZASHION ; OTV LE DOUBLON ; OTV OMNIUM DE TRAITEMENT ET DE VALORISATION ; OTV OMNIUM DE TRAITEMENT ET DE VALORISATION 9240 ; OO TE UE OMUNION DO TORETOMAN E DO UARORIZASHION ; OTV OMNIUM TRAITEMENT VALORISA ; OTV ; OTV (OMNIUM DE TRAITEMENT ET DE VALORISATION) ; OTV OMNIUM DE TRAITEMENT ET DE VALORISATION 92407 COURBEVOIE FR

Inventor(s): (std): FAIVRE MICHEL ; DESBOS GILBERT ; GILBERT DESBOS ; JIRUBEERU DESUBOSU ; MICHEL FAIVRE ; MISHIERU FUEEBURU ; FAIVRE M ; DESBOS G

Inventor(s): MISHIERU FUEEURU ; M FAIVRE ; GILBERT DESBOS ET MICHEL FAIVRE ; DESBOS GILBERT 75018 PARIS FR ; FAIVRE MICHEL 77500 CHELLES FR ; G DESBOS

Agent(s): GRIFFITH HACK

Abstract: Source: DE3412394C1 The invention relates to a process and an **apparatus** for cleaning aeration tubes, in particular from activation tanks in sewage treatment plants. The aeration tube 1 is sprayed simultaneously from the outside and inside by a high pressure rinsing medium, the aeration tube 1 being moved past the spraying nozzles 2, 3 by means of a piston/cylinder arrangement 4 which can be impinged by the rinsing medium.

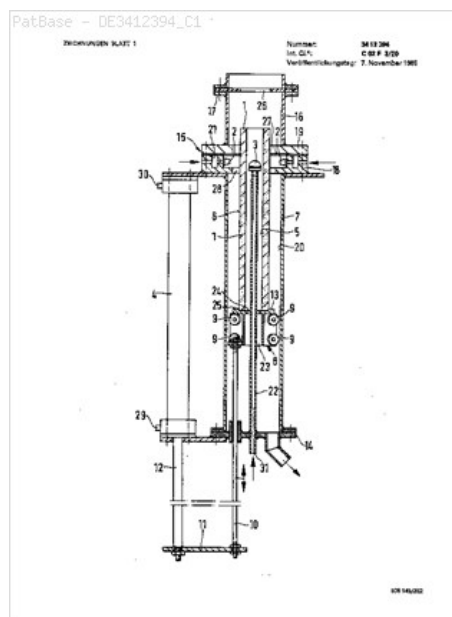
International (IPC 8-9): B01F15/00 B01F3/04 B05B13/02 C02F3/20 (Advanced/Invention);

B01F15/00 B01F3/04 B05B13/02 C02F3/20 (Core/Invention)

International (IPC 1-7): B08B3/02 C02F1/74 C02F3/16 C02F3/20

CPC: Y02W10/15 C02F3/20 B01F3/04262 B01F15/00032 B01F2003/0439 B05B13/02

European: B01F15/00G2B B01F3/04C1B2K B05B13/02 C02F3/20 L01F3/04C1B2U10



Publication number	Publication date	Application number	Application date
AT391855 B	19901210	AT19850000932	19850328
AT93285 A	19900615	AT19850000932	19850328
DE3412394 C1	19851107	DE19843412394	19840403
NL8500567 A	19851101	NL19850000567	19850228

DE19843412394 19840403

Probable Assignee: DIDIER WERKE AG

Assignee(s): (std): DIDIER WERKE AG

Assignee(s): DIDIER WERKE AG 6200 WIESBADEN DE ; DIDIER WERKE TE WIESBADEN BONDSREPUBLIEK DUITSLAND AG ; DIDIER WERKE 6200 WIESBADEN DE AG ; DIDIER WERKE A G ; DIDIER WERKE A G TE WIESBADEN BONDSREPUBLIEK DUITSLAND

Inventor(s): (std): HOFBECK RICHARD : SCHMITT WAELTI : SCHMITT WAELTI DIPL ING

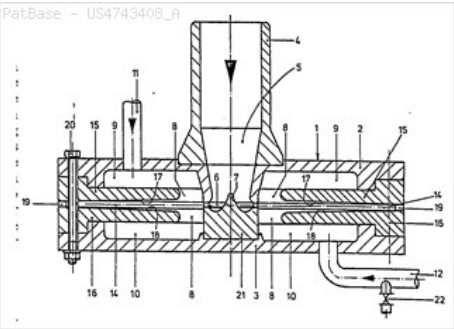
Inventor(s): SCHMITT WAELTI DIPLING ; SCHMITT WAELTI 6208 BAD SCHWALBACH DE ; HOFBECK RICHARD 6719 EISENBERG DE

Title: DEVICE FOR INTRODUCING A GAS INTO LIQUID

Abstract: Source: US4743408A PCT No. PCT/EP85/00571 Sec. 371 Date Aug. 11, 1986 Sec. 102(e) Date Aug. 11, 1986 PCT Filed Oct. 28, 1985 PCT Pub. No. WO86/02577 PCT Pub. Date May 9, 1986.A device for continuously introducing a gas into a liquid, in connection with a flotation operation, a deinking unit or the like. The liquid issues from an endless annular gap (6) which does not have any internal obstacles whatever such as boundary walls or the like and, after absorbing the gas, flows into a radial diffuser (14) from which the liquid, enriched with gas bubbles, issues into the treatment container of the **apparatus**. Therefore, for a treatment tank of circular cross-section, a single gasification device which is disposed centrally in the vicinity of the bottom is sufficient. An optional swirl flow may be produced by suitable deflection in the region of the diffuser or in the chamber for the liquid, which is disposed upstream in the annular gap.

Classifications:

International (IPC 8-9): B01F3/04 B01F5/04 B03D1/24 C02F3/22 (Advanced/Invention); B01F3/04 B01F5/04 B03D1/14 C02F3/22 (Core/Invention)
International (IPC 1-7): B01F3/04 B01F5/04 B01F5/06 B01J10/00 B03D1/18 C02F1/24 C02F1/74 C02F3/20 C02F3/22 C02F7/00 D21C5/02 D21F1/70
CPC: Y10S261/75 B01F5/0401
European: B01F5/04B
US: 261/123 261/DIG.75



Family:

Publication number	Publication date	Application number	Application date
DE3439464 A1	19860507	DE19843439464	19841027
DE3573217 D1	19891102	DE19853573217	19851028
EP0198073 A1	19861022	EP19850905619	19851028
EP0198073 B1	19890927	EP19850905619	19851028
JP62500576 T2	19870312	JP19850505232T	19851028
US4743408 A	19880510	US19860892026	19860811
WO8602577 A1	19860509	WO1985EP00571	19851028

Priority:
DE19843439464 19841027 DE19853573217 19851028 WO1985EP00571 19851028

Probable Assignee: HOESCH FOERDERTECH

Assignee(s): (std): HOESCH FOERDERTECH ; SCHWARZE HANS OTTO

Assignee(s): HOSCH FOERDERTECHNIK GMBH ; HOSCH FORDERTECHNIK GMBH

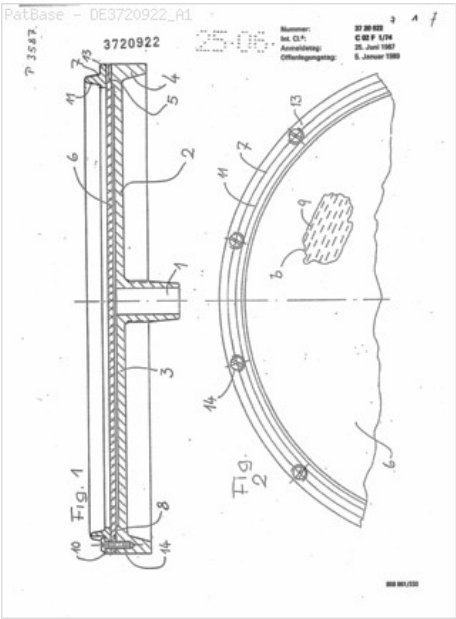
Inventor(s): (std): SCHWARZE HANS OTTO

Designated states: AT BE CH DE FR GB IT JP LI LU NL SE US

Title: **APPARATUS** FOR AERATING **WATER**

Abstract: Source: DE3720922A1 The invention starts from an **apparatus** for aerating **water** having a planar holder and, arranged thereon, a rubber plate having fine slots for passing through air. The plate rim is pressed onto the holder in this case by a surrounding frame. In order to prevent changes in position of the plate and to achieve good sealing, on the basis of the invention, the frame is vulcanised onto the plate outer rim.

Classifications:
International (IPC 8-9): B01F3/04 C02F3/20 (Advanced/Invention);
B01F3/04 C02F3/20 (Core/Invention)
International (IPC 1-7): B01F3/04 B01J3/02 B01J4/00 C02F1/74 C02F3/20
CPC: Y02W10/15 B01F3/04269 B01F2003/04297 C02F3/201
European: B01F3/04C1B2L C02F3/20B L01F3/04C1B2T4



Family:

Publication number	Publication date	Application number	Application date
DE3720922 A1	19890105	DE19873720922	19870625

Priority:

DE19873720922 19870625

Probable Assignee: JAEGER ARNOLD

Assignee(s): (std): JAEGER ARNOLD

Inventor(s): (std): JAEGER ANDREAS

Title: HIGH PRESSURE OXYGEN-SATURATED WATER TREATMENT APPARATUS

Abstract: Source: US4956080A The improved high pressure oxygen-saturated water treatment apparatus of the present invention functions to provide super-saturated oxygen treatment to waste water for purification thereof. The apparatus includes a pressurized treatment tank having a substantial longitudinal dimension, with a chamber separation plate forming two interconnected chambers in the tank. An input conduit for flowing waste water into the first chamber of the tank is provided. An oxygen input conduit is connected to the tank for providing oxygen-containing gas under substantial pressure within the tank. An oxygen output conduit is also disposed on the tank for receiving the oxygen-containing gas from the tank to form a pressurized oxygen-containing stream. A venturi is also disposed on the tank for receiving and combining the pressurized oxygen-containing stream with recirculated water from the tank to form a combined injection stream of pressurized water which is super-saturated with oxygen, and which is then injected into the treatment water contained within the tank. As the tank is maintained at a pressure lower than that of the injection stream, the pressurized oxygen comes out of solution in tiny bubbles preferentially about particles of solid waste to entrain and provide supplemental floatation thereto. The result is to substantially oxidize any oxidizable material contained within the tank. The treated water is then removed by suitable means from the tank from the second chamber thereof.

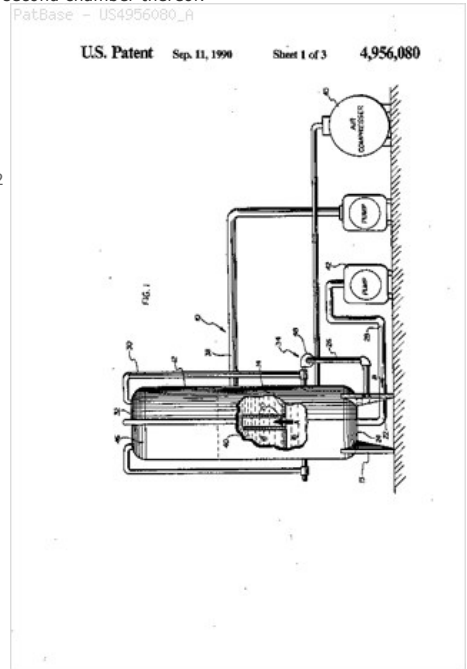
Classifications:

International (IPC 8-9): B01F3/04 B01F3/08 B01F5/02 B01F5/04 B01F5/10 C02F1/72 C02F1/74 C02F3/02 C02F3/12 C02F3/26 (Advanced/Invention); B01F3/04 B01F3/08 B01F5/00 B01F5/02 B01F5/04 C02F1/72 C02F1/74 C02F3/02 C02F3/12 C02F3/26 (Core/Invention)

International (IPC 1-7): B01F5/04 C02F1/24 C02F1/74 C02F3/02 C02F3/12 C02F3/26
CPC: Y10S261/75 Y02W10/15 C02F3/1289 B01F3/04099 B01F3/0446 B01F3/04836 B01F3/0876 B01F5/0206 B01F5/0413 B01F5/0428 B01F5/106 C02F1/72 C02F3/1294 C02F3/26

European: B01F3/04C B01F3/04C4 B01F3/04C9A B01F3/08F4 B01F5/02B B01F5/04C12 B01F5/04C12S4 B01F5/10F C02F1/72 C02F3/12V4 C02F3/12V6 C02F3/26

US: 210/109 210/195.1 210/197 210/205 210/218 210/221.2 210/258 210/262 210/703 210/712 210/721 210/758 210/765 261/29 261/36.1 261/361 261/DIG.75



Family:

Publication number	Publication date	Application number	Application date
AT101383 E	19940215	AT19880307147T	19880803
CA1327652 A1	19940308	CA19880573599	19880802
DE3887711 D1	19940324	DE19883887711	19880803
DE3887711 T2	19940804	DE19883887711T	19880803
EP0302708 A2	19890208	EP19880307147	19880803
EP0302708 A3	19890712	EP19880307147	19880803
EP0302708 B1	19940209	EP19880307147	19880803
JP2048098 A2	19900216	JP19880194304	19880803
US4956080 A	19900911	US19870080993	19870803
US5087377 A	19920211	US19900478668	19900212

Priority:

US19870080993 19870803 CA19880573599 19880802 EP19880307147 19880803
US19900478668 19900212

Probable Assignee: MICROLIFT SYSTEMS LP

Assignee(s): (std): DEIFUTETSUKU CORP ; DIFTECH CORP ; MICROLIFT SYSTEMS INC ; MICROLIFT SYSTEMS PART LTD ; MICROLIFT SYSTEMS LP

Assignee(s): MICROLIFT SYSTEMS ; MICROLIFT SYSTEMS PARTNERSHIP A PARTNERSHIP OF LTD ; MICROLIFT SYSTEMS INC STURGEON BAY WIS US ; MICROLIFT SYSTEMS PARTNERSHIP A PARTNERSHIP OF LTD NV ; SATOX ENVIRONMENTAL INC ; SATOX ENVIRONMENTAL INC TAMPA FLORIDA A FLORIDA CO ; SATOX ENVIRONMENTAL INC TAMPA FLORIDA A FLORIDA CORP ; MICROLIFT SYSTEMS PARTNERSHIP A PARTNERSHIP OF NV ; MICROLIFT SYSTEMS PARTNERSHIP LTD ; JOSEFIK JOHN ; DIFTECH A CORP OF ILLINOIS CORP ; DIFTECH A ILLINOIS CORP CORP

Inventor(s): (std): JIYON JIYOSUFITSUKU ; JOSEFIK JOHN

Inventor(s): JOSEFIK JOHN BERWYN ILLINOIS 60402 US

Agent(s): MEREDITH W R QC

Designated states: AT BE CH DE FR GB IT LI LU NL SE

Title: **APPARATUS** FOR **PURIFICATION**, FOR EXAMPLE OF CONTAMINATED GROUNDWATER.

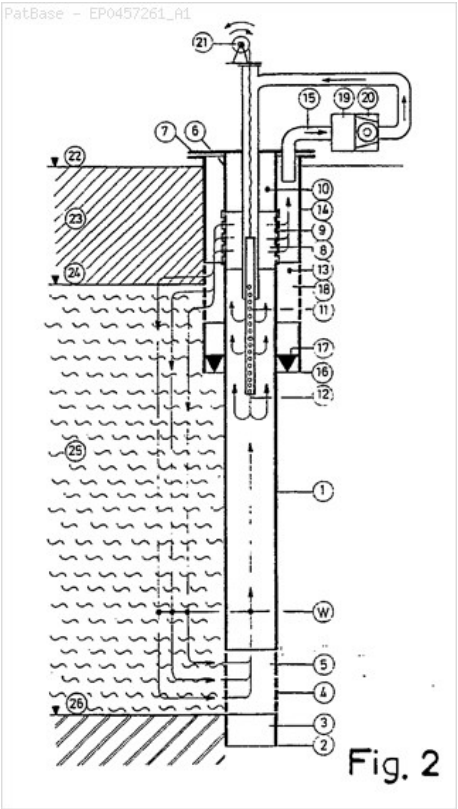
Abstract: The **apparatus** has a **water** transport tube (1) and a jacket tube (14). These are connected at their upper ends to give a structural unit. The **water** transport tube (1) is furnished along its length with one upper and one lower **water** permeation point (5, 8). The jacket tube (14) has a **water** outlet orifice (18) offset in the longitudinal direction of the tubes (1, 14) in relation to the upper **water** permeation point (8). A gas injection tube (11) is introduced from outside into the **water** transport tube (1), which injection tube is of such a length that the gas outlet orifice is beneath the upper **water** permeation point (8). A gas outlet tube (15) is connected to the space (13) between the **water** transport tube (1) and the jacket tube (14) surrounding this tube, through which outlet tube gas held in the space (13) and containing the pollutants from the ground **water** can be supplied to a filter (19).

Classifications:

International (IPC 8-9): B01F3/04 B09C1/00 C02F1/20 C02F1/64 C02F1/72 C02F3/22 C02F7/00 C02F9/00 E21B43/12 (Advanced/Invention); B01F3/04 B09C1/00 C02F1/20 C02F1/62 C02F1/72 C02F3/22 C02F7/00 C02F9/00 E21B43/12 (Core/Invention)

International (IPC 1-7): C02F1/00 C02F1/72 C02F1/74 C02F7/00 C02F9/00 E03B3/06 **CPC:** Y02W10/15 C02F1/645 C02F3/223 B01F3/04262 B01F2003/04319 B01F2003/04865 B01F2215/0052 B09C1/002 B09C2101/00 C02F1/20 C02F2103/06 E21B43/122

European: B01F3/04C1B2K B09C1/00B C02F1/20 C02F1/64C C02F3/22C E21B43/12B2 L01F215/00A62 L01F3/04C1B2T10 L01F3/04C20B4 L09C101/00 M02F103/06



Family:

Publication number	Publication date	Application number	Application date
DE4040820 A1	19911121	DE19904040820	19901220
DE4040820 C2	19940721	DE19904040820	19901220
DE59100057 D1	19930415	DE19915000057	19910514
DE9005565 U1	19900719	DE19900005565U	19900516
EP0457261 A1	19911121	EP19910107766	19910514
EP0457261 B1	19930310	EP19910107766	19910514

Priority:

DE19900005565U 19900516 DE19904040820 19901220 DE19915000057 19910514

Probable Assignee: FRESE HERMANN

Assignee(s): (std): FRESE HERMANN

Assignee(s): FRESE HERMANN 2808 SYKE DE ; FRESE HERMANN 28857 SYKE

Inventor(s): (std): FRESE HERMANN

Inventor(s): FRESE HERMANN 28857 SYKE ; FRESE HERMANN 2808 SYKE DE

Designated states: CH DE FR GB LI NL

Title: APPATUS FOR CLEANING AND AERATION OF OPEN BODIES OF WATER

Abstract: Source: US5071550A An apparatus for cleaning and aeration of open bodies of water includes a floating structure partially extending above a water surface and having at least one opening in its lower region through which, water flows into the apparatus, and a fan arranged in the upper region of the floating structure for creating vacuum that enables flow of water inside of the floating structure. An air receiving space is defined inside of the floating structure. A perforated plate which is located below a water surface established in the floating structure, limits the air receiving space from above. The air receiving space is connected with atmosphere by a gas conducting conduit.

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 C02F3/20 C02F3/22 C02F7/00 (Advanced/Invention);

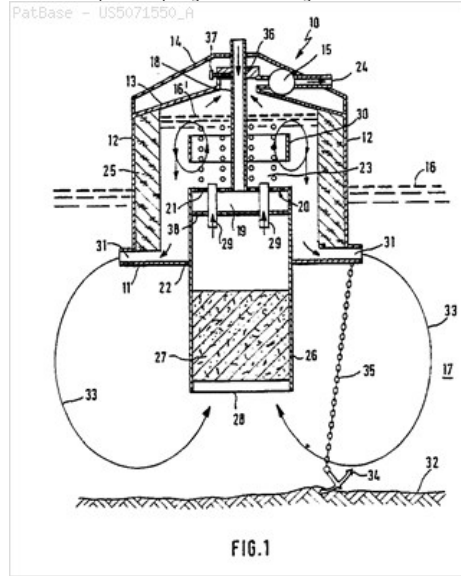
B01F3/04 C02F3/22 (Advanced/Non-invention); B01F3/04 C02F3/20 C02F3/22 C02F7/00 (Core/Invention)

International (IPC 1-7): B01D29/00 B01F3/04 B08B5/04 C02F1/74 C02F3/20 C02F3/22 C02F7/0 C02F7/00 C10J1/08

CPC: Y02W10/15 C02F3/20 C02F7/00

European: C02F3/20 C02F7/00

US: 210/242.2 210/406 210/416.1 261/120 261/123 261/5



Family:

Publication number	Publication date	Application number	Application date
AT78456 E	19920815	AT19900115956T	19900821
AU199063081 A1	19910328	AU19900063081	19900921
AU631926 B2	19921210	AU19900063081	19900921
CA2025986 AA	19910323	CA19902025986	19900921
DE3931617 A1	19910404	DE19893931617	19890922
DE59000214 D1	19920827	DE19905000214	19900821
DE8915644 U1	19901213	DE19890015644U	19890922
EP0418571 A1	19910327	EP19900115956	19900821
EP0418571 B1	19920722	EP19900115956	19900821
ES2034804 T3	19930401	ES19900115956T	19900821
JP1944194 C3	19950623	JP19900247655	19900919
JP3118900 A2	19910521	JP19900247655	19900919
JP6069559 B4	19940907	JP19900247655	19900919
US5071550 A	19911210	US19900581035	19900912

Priority:

DE19890015644U 19890922 DE19893931617 19890922 DE19905000214 19900821
CA19902025986 19900921 EP19900115956 19900821

Probable Assignee: INDUSTRIE ENGINEERING GMBH

Assignee(s): (std): BERNHARDT BRUNO ; IEG IND ENGINEERING GMBH ; II EE G IND GMBH

Assignee(s): INDUSTRIE ENGINEERING GMBH ; PARIBAS ; MACTEC INC ; MACTEC ENVIRONMENTAL TECHNOLOGIES CO ; MACTEC ENVIRONMENTAL TECHNOLOGIES CO LLC ; IEG INDUSTRIE ENGINEERING GMBH ; IEG INDUSTRIE ENGINEERING GMBH 7410 REUTLINGEN DE

Inventor(s): (std): BERNHARDT BRUNO ; BRUNO BERNHARDT ; BUERMANN WERNER DR ING ; BURUUNO BERUNHARUTO ; HERRLING BRUNO DR ING

Inventor(s): HERRLING BRUNO DR ING 7500 KARLSRUHE DE ; BUERMANN WERNER DR ING 7505 ETTLINGEN DE ; BERNHARDT BRUNO 7410 REUTLINGEN DE ; BERNHARDT BRUNO W 7410 REUTLINGEN DE

Agent(s): FB RICE; MARKS AND CLERK

Designated states: AT CH DE ES FR GB IT LI NL SE

Title: Device for mixing air and **water** in a **water** purifier

Abstract: Source: US6036178A PCT No. PCT/SE96/00817 Sec. 371 Date Dec. 15, 1997 Sec. 102(e) Date Dec. 15, 1997 PCT Filed Jun. 24, 1996 PCT Pub. No. WO97/00831 PCT Pub. Date Jan. 9, 1997A device for mixing air and **water** in a **water** purifier comprises a **water** inlet pipe (3), which is connected to a **water** source and extends into a **water** purifier tank (2), and an air inlet pipe (6) extending coaxially inside the **water** pipe. One end of the air pipe is positioned outside the tank and the other end is positioned inside the **water** pipe to form an annular gap (8) between the end (7) of the air pipe and the inner wall of the **water** pipe. The **water** pipe has a mixing portion (9, 13) extending from the annular gap (8) to the mouth of the **water** pipe in the tank. In the mixing portion there is at least one ring (10-12) arranged on the inside of the **water** pipe and being hit by an annular **water** jet formed as the **water** passes through the gap (8), thereby forcing the **water** to mix with the air.

Classifications:

International (IPC 8-9): B01F3/04 B01F5/02 B01F5/04 (Advanced/Invention); B01F5/02 (Advanced/Non-invention); B01F3/04 B01F5/02 B01F5/04 (Core/Invention)

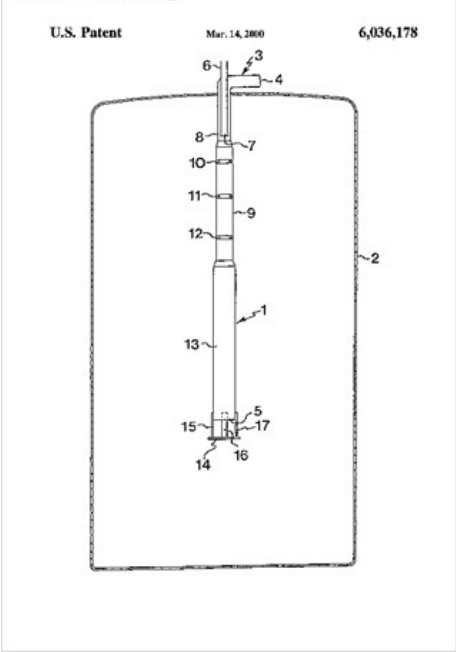
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CPC: B01F3/04475 B01F5/0268 B01F5/0403

European: B01F3/04C4B2 B01F5/02F B01F5/04C

US: 261/76 261/78.2 261/782

PatBase - US6036178_A



Family:

Publication number	Publication date	Application number	Application date
AT198311 E	20010115	AT19960921201T	19960624
AU199662477 A1	19970122	AU19960062477	19960624
AU696022 B2	19980827	AU19960062477	19960624
CN1101787 C	20030219	CN19961094951	19960624
CN1188461 A	19980722	CN19961094951	19960624
CZ289984 B6	20020515	CZ19970004138	19960624
CZ9704138 A3	19980513	CZ19970004138	19960624
DE69611384 D1	20010201	DE19966011384	19960624
DE69611384 T2	20010809	DE19966011384T	19960624
DK0871594 T3	20010326	DK19960921201T	19960624
EA000135 B1	19981029	EA19980000080	19960624
EE9700367 A	19980615	EE19970000367	19960624
EP0871594 A1	19981021	EP19960921201	19960624
EP0871594 B1	20001227	EP19960921201	19960624
HU9901689 AB	19990830	HU19990001689	19960624
HU9901689 AC	19991129	HU19990001689	19960624
NO319221 B1	20050704	NO19970005824	19971211
NO975824 A	19971219	NO19970005824	19971211
NO975824 A0	19971211	NO19970005824	19971211
PL183241 B1	20020628	PL19960324111	19960624
PL324111 A1	19980511	PL19960324111	19960624
SE504449 C2	19970217	SE19950002269	19950622
SE9502269 A	19961223	SE19950002269D	19950622
SE9502269 A0	19950622	SE19950002269	19950622
SE9502269 L	19961223	SE19950002269	19950622
SK172497 A3	19980708	SK19970001724	19960624
US6036178 A	20000314	US19970973980	19971215
WO9700831 A1	19970109	WO1996SE00817	19960624

Priority:

SE19950002269 19950622 WO1996SE00817 19960624

Probable Assignee: LIBRADON AB

Assignee(s): (std): LIBRADON AB ; LIBRADON AB SVEDALA ; NILSSON BROR ; AQUAPURITAS CORP

Assignee(s): AQUAPURITAS CORP WALTHAM ; LIBRADON SVEDALA AB ; LIBRADON LILLA SVENSTORPS GAR AB

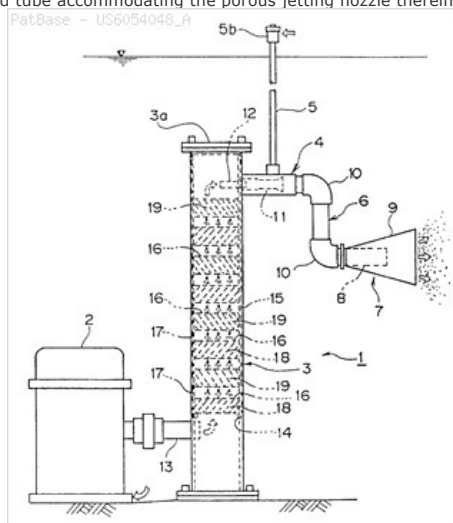
Inventor(s): (std): NILSSON BROR ; BROR NILSSON

Agent(s): DAVIES COLLISON CAVE

Designated states: AL AM AT AU AZ BB BE BG BR BY CA CH CN CZ DE DK EE ES FI FR GB GE GR HU IE IL IS IT JP KE KG KP KR KZ LI LK LR LS LT LU LV MC MD MG MK MN MW MX NL NO NZ PL PT RO RU SD SE SG SI SK SZ TJ TM TR TT UA UG US UZ VN

Classifications:

US: 210/199 210/205 210/220 210/258 210/259 261/123 261/37 261/76 261/DIG.42
261/DIG.75



Publication number	Publication date	Application number	Application date
JP10286594 A2	19981027	JP19970115210	19970417
JP3121287 B2	20001225	JP19970115210	19970417
US6054048 A	20000425	US19980111298	19980707

JP19970115210 19970417 US19980111298 19980707

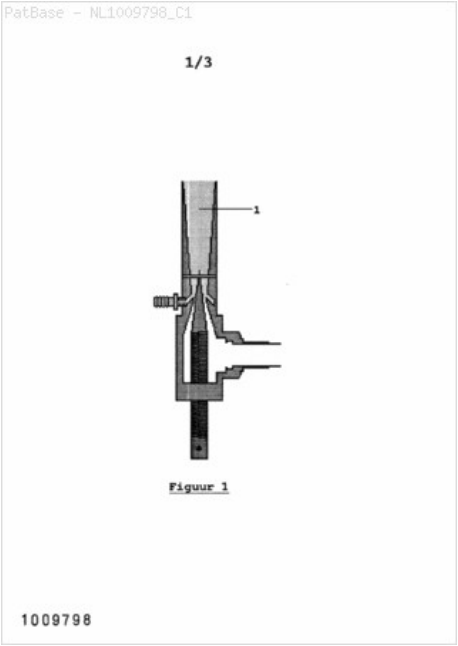
Assignee(s): (std): KURANTSU KK ; NIPPO SETSUBI KK ; NIPPOH SETSUBI CO INC

Inventor(s): (std): KAERIYAMA HISASHI ; KOWARI YASUKAZU ; KAERIYAMA WATARU ; FURUWARI YASUKAZU

Title: Water purification apparatus for e.g. fish pond or fish farm effluent

Abstract: Source: NL1009798C Apparatus for mechanically and biologically purifying water and enriching it with oxygen adds ozone to the water and later removes it, any traces of ozone left in the water being removed by aeration of the water, a pump being used to mix the gas and water together, following which the gas is removed and replaced with a fresh amount of air. The apparatus significantly increases the time spent by the gas bubbles in the water and increases gas bubble life up to threefold. Within the apparatus, a first treatment step ensures a relatively long contact time between the water and ozone or another gas, along a relatively long contact length equal to up to twice the height of the pipe (10) shown in the figure. During a significant part of this contact time the gas bubbles will be under pressure, ensuring better mixing with the water. In a second treatment step the gas added in the first step is removed, a closed loop being used to return the gas via a pipe (21) to the first step, improving the overall efficiency of the treatment process.

Classifications:
International (IPC 8-9): B01F3/04 C02F1/74 C02F1/78 (Advanced/Invention); B01F13/10 (Advanced/Non-invention)
International (IPC 1-7): C02F1/72
CPC: B01F3/04099 B01F3/0446 B01F15/0248 B01F2003/04879 B01F2013/1052 C02F1/74 C02F1/78
European: B01F15/02B40L5 B01F3/04C4 C02F1/74 C02F1/78 L01F13/10E L01F3/04C L01F3/04C20B4C



Family:

Publication number	Publication date	Application number	Application date
NL1009798 C1	19981110	NL19981009798	19980804

Priority:

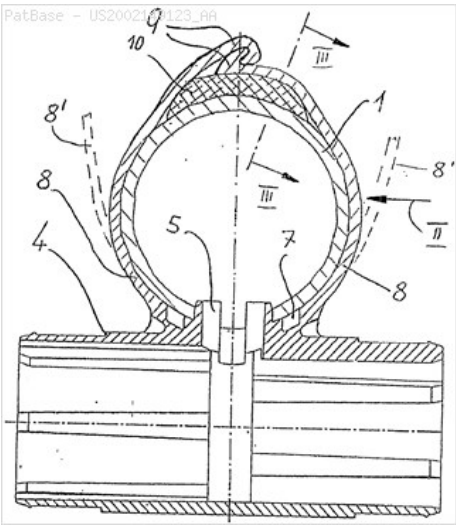
NL19981009798 19980804

Probable Assignee: SCHULDINK HENDRIKUS EGBERT
Assignee(s): (std): SCHULDINK HENDRIKUS EGBERT
Assignee(s): HENDRIKUS EGBERT SCHULDINK
Inventor(s): (std): SCHULDINK HENDRIKUS EGBERT
Inventor(s): HENDRIKUS EGBERT SCHULDINK

Title: APPARATUS FOR THE DETACHABLE SECUREMENT OF AERATION DEVICES IN WATER AERATING UNITS

Abstract: Source: US2002149123A An apparatus for the detachable securement of aeration devices to air supply lines of units for aerating water with fine bubbles is provided. The fastening elements that are intended to surround the air supply line comprise two flexible securing elements, one end of which is anchored to the aeration device, or to the holder thereof, while the free ends are adapted to be hooked together. At least one insert is inserted, under tension, between hooked together securing elements on the one hand, and the air supply line on the other hand.

Classifications:
International (IPC 8-9): B01F3/04 C02F3/20 F16B3/00 F16B7/04 F16L3/137 (Advanced/Invention); B01F3/04 C02F3/20 F16B3/00 (Core/Invention)
International (IPC 1-7): B01F3/04 C02F1/74 C02F3/20 C02F7/00 F16B7/04 F16L3/137
CPC: Y02W10/15 C02F3/201 B01F3/0412 B01F2003/04177 F16B3/00
European: B01F3/04C1B1 C02F3/20B F16B3/00 L01F3/04C1B1F6
US: 210/22 210/220 210/220S 261/122.1 261/122.100P



Family:

Publication number	Publication date	Application number	Application date
CA2351255 AA	20011223	CA20012351255	20010622
DE10029689 A1	20020103	DE20001029689	20000623
EP1167304 A1	20020102	EP20010114967	20010620
US2002149123 AA	20021017	US20010887858	20010622

Priority:
DE20001029689 20000623 CA20012351255 20010622

Probable Assignee: GUMMI JAGER GMBH AND CIE KG

Assignee(s): (std): GUMMI JAEGER GMBH AND CIE KG ; GUMMI JAEGER KG GMBH AND CIE

Assignee(s): GUMMI JAGER GMBH AND CIE KG ; GUMMI JAGER KG GMBH AND CIE ; GUMMI JAGER KG GMBH ; BRUSE FRANZ FERDINAND ; BRUSS FRANZ FERDINAUD ; EDEL VOLKER

Inventor(s): (std): BRUSE FRANZ FERDINAND ; BRUSS FRANZ FERDINAND ; BRUSS FRANZ FERDINAUD ; EDEL VOLKER ; EDEL VOLKER DR

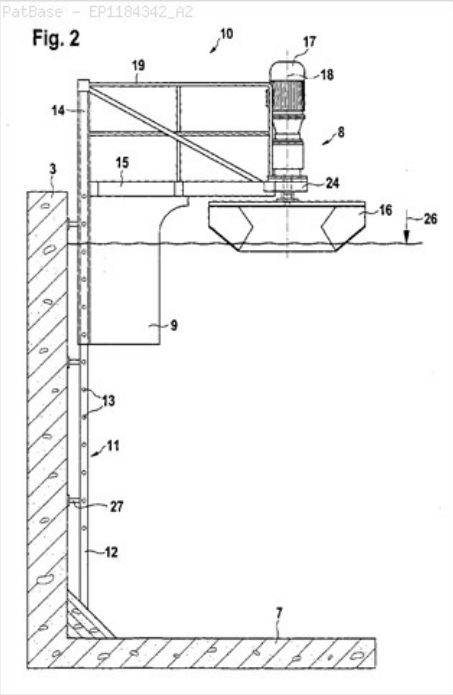
Agent(s): FETHERSTONHAUGH AND CO

Designated states: AT DE FR GB

Title: DEVICE FOR WATER TREATMENT

Abstract: Sewage processing assembly has at least one activated-sludge basin, with an intermittent aeration rotor supported by at least one float carrier. The float carrier (10), with the aeration rotor (8), is near a basin wall (3) at a vertical guide rail (11), to give it an adjusted height setting according to the sewage level (26) in the basin. The activated sludge basin, to process sewage, has a float carrier which projects at an angle from a vertical section (14) at the sliding guide, and a horizontal overhang (15) which holds the aeration rotor. The vertical section has two longitudinal carriers which move along the sides (12) of the vertical guide rail. The guide rail sides are linked by rungs (13) into a ladder. The vertical guide rail is mounted to the basin wall by brackets, to hold it at a gap from the wall surface. The longitudinal carriers of the float carrier are U-shaped to fit around the sides of the guide rail. The horizontal overhang is a platform formed by two side members linked by lateral carriers, and the platform is covered by a grid. The float (9) is fitted into the corner between the vertical and overhang sections of the float carrier. An Independent claim is included for an aeration rotor with a drive motor (17) to rotate the paddle wheel (16) round a vertical axis (18) which is shrouded within a housing, open at the bottom and with air inlet passages at the top.

Classifications:
International (IPC 8-9): B01F3/04 B01F7/16 C02F3/14 C02F3/16 (Advanced/Invention); C02F1/74 C02F3/02 (Advanced/Non-invention); B01F3/04 B01F7/16 C02F3/14 (Core/Invention); C02F1/74 C02F3/02 (Core/Non-invention)
International (IPC 1-7): B01F3/04 B01F7/16 C02F3/14 C02F3/16 C02F3/30
CPC: Y02W10/15 B01F7/16 B01F3/04773 B01F2215/0052 C02F1/74 C02F3/02 C02F3/16
European: B01F3/04C6C2 B01F7/16 C02F3/16 L01F215/00A62 M02F1/74 M02F3/02



Family:

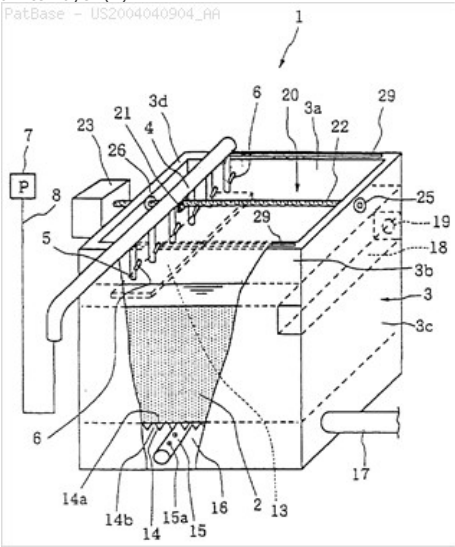
Publication number	Publication date	Application number	Application date
AT259334 E	20040215	AT20010120118T	20010822
DE20014964 U1	20020124	DE20002014964U	20000830
DE50101465 D1	20040318	DE20015001465	20010822
DK1184342 T3	20040614	DK20010120118T	20010822
EP1184342 A2	20020306	EP20010120118	20010822
EP1184342 A3	20020612	EP20010120118	20010822
EP1184342 B1	20040211	EP20010120118	20010822
ES2214371 T3	20040916	ES20010120118T	20010822
HU0103492 A0	20011128	HU20010003492	20010829
HU0103492 AB	20020429	HU20010003492	20010829
PL349246 A1	20020311	PL20010349246	20010821

Priority:
DE20002014964U 20000830 DE20015001465 20010822
Probable Assignee: BIONIK GMBH INNOVATIVE TECHNIK
Assignee(s): (std): BIONIK GMBH INNOVATIVE TECHNIK
Assignee(s): BIONIK GMBH INNOVATIVE TECHNIK F DIE UMWELT ; BIONIK GMBH INNOVATIVE TECHNIK FDIE UMWELT ; BIONIK GMBH INNOVATIVE TECHNIK FUER DIE UMWELT ; BIONIK GMBH INNOVATIVE TECHNIK FUR DIE UMWELT
Inventor(s): (std): RICHTER MICHAEL
Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE TR

Title: **WATER** TREATMENT DEVICE

Abstract: Source: US2004040904A A **water** treatment device capable of filtering out iron and manganese in raw **water** by oxidizing them and making them insoluble in **water** includes a raw **water** supply tube (4), one or more jet nozzles (5), each being at one end portion thereof in communication with the raw **water** supply tube (4) and having at the other end thereof a raw **water** jetting outlet for blowing out the raw **water** in a jet stream, one or more air introducing tubes (6) provided in correspondence to the jet nozzle or jet nozzles (5), each being at one end portion thereof opened to the atmosphere and being at the other end portion thereof opened to the inside of a corresponding one of the jet nozzles (5) upstream of the raw **water** jetting outlet and a filter container (3) containing a filter layer (2).

Classifications:
International (IPC 8-9): B01D24/02 B01D24/14 B01D24/20 B01D24/46 B01D29/62 B01F3/04 B01F5/02 B01F5/04 C02F1/64 C02F1/74 C02F1/78 C02F3/04 C02F3/12 (Advanced/Invention); C02F1/00 C02F1/64 (Advanced/Non-invention); B01D24/00 B01D24/02 B01D29/62 B01F3/04 B01F5/02 B01F5/04 C02F1/62 C02F1/74 C02F1/78 (Core/Invention); C02F1/00 (Core/Non-invention)
International (IPC 1-7): B01D1/00 B01D24/02 B01D24/20 B01D24/46 B01D29/62 C02F1/64 C02F1/74 C02F1/78 C02F3/04 C02F3/12
CPC: B01D24/14 B01F3/0446 B01F3/0473 B01F3/04758 B01F5/02 B01F5/045 C02F1/001 C02F1/645 C02F1/74 C02F2101/203 C02F2101/206 C02F2303/16
European: B01D24/14 B01F3/04C4 B01F3/04C6 B01F3/04C6A6 B01F5/02 B01F5/04C13 C02F1/64C C02F1/74 M02F1/00D M02F101/20B M02F101/20D M02F303/16
US: 210/205 210/209 210/722



Family:

Publication number	Publication date	Application number	Application date
AU2001295969 AA	20020506	AU20010295969	20011019
BRPI0114893 A	20031007	BR2001PI14893	20011019
CA2426634 AA	20030422	CA20012426634	20011019
CN1250458 C	20060412	CN20018020642	20011019
CN1481338 A	20040310	CN20018020642	20011019
EP1335882 A2	20030820	EP20010976757	20011019
EP1335882 B1	20151007	EP20010976757	20011019
JP2002126768 A2	20020508	JP20000324268	20001024
JP4076049 B2	20080416	JP20000324268	20001024
KR20030042031 A	20030527	KR20037005654	20030423
MXPA03003543 A1	20031015	MX2003PA03543	20030423
RU2003115444 A	20040910	RU20030115444	20011019
RU2241521 C1	20041210	RU20030115444	20011019
US2004040904 AA	20040304	US20030399119	20030925
US7014758 BB	20060321	US20010399119	20011019
WO0234677 A2	20020502	WO2001JP09175	20011019
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ZA200303370 A	20040330	ZA20030003370	20030430

Priority:
JP20000324268 20001024 WO2001JP09175 20011019

Probable Assignee: TADAYOSHI NAGAOKA

Assignee(s): (std): NAGAOKA TADAYOSHI ; TADAYOSHI NAGAOKA

Inventor(s): (std): NAGAOKA TADAYOSHI ; TADAYOSHI NAGAOKA ; NAGAOKA TADAJOSI

Agent(s):
DAVIES COLLISON CAVE; MOFFAT AND CO; VON KREISLER SELTING WERNER PARTNERSCHAFT VON PATENTANWAELTEN U RECHTSANWAELTEN MBB; HEDMAN AND COSTIGAN PC

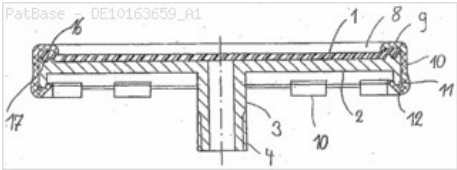
Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NL NO NZ PH PL PT RO RU SD SE SG SI SK SL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

Title: APPARATUS FOR AERATING WATER COMPRISES SUPPORT WITH PLATE OF ELASTOMER WITH FINE SLITS ON IT, PRESSED TOGETHER USING CLAMP(S)

Abstract: Apparatus for aerating water comprises support with a plate of elastomer with fine slits on it and with clamp(s) pressing plate and support together.

Classifications:
International (IPC 8-9): B01F3/04 C02F3/20 (Advanced/Invention);
C02F1/74 (Advanced/Non-invention);
B01F3/04 C02F3/20 (Core/Invention);
C02F1/74 (Core/Non-invention)

International (IPC 1-7): C02F1/74
CPC: Y02W10/15 C02F3/201 B01F3/04269 B01F2003/04276 B01F2003/04297
B01F2003/04368 C02F1/74
European: B01F3/04C1B2L C02F3/20B L01F3/04C1B2S L01F3/04C1B2T4
L01F3/04C1B2U4 M02F1/74



Family:

Publication number	Publication date	Application number	Application date
DE10163659 A1	20030703	DE20011063659	20011221

Priority:

DE20011063659 20011221

Probable Assignee: GUMMI JAEGER KG GMBH AND CIE

Assignee(s): (std): GUMMI JAEGER GMBH AND CIE KG ; GUMMI JAEGER KG GMBH AND CIE

Title: **WATER** PURIFYING **APPARATUS**

Abstract: Source: US2008237901A A **water** purifying **apparatus** includes a tubular portion having an inlet for receiving **water** and an outlet for emitting the **water**, and a nozzle portion disposed inside the tubular portion to allow the **water** flowing through the tubular portion to pass therethrough. The nozzle portion has a nozzle opening for discharging the **water** toward the outlet. The tubular portion is provided with air supply means for mixing air taken in from outside the tubular portion with the **water** discharged from the nozzle opening. The nozzle opening has a shape defined by one line segment or a combination of a plurality of line segments.

Classifications:

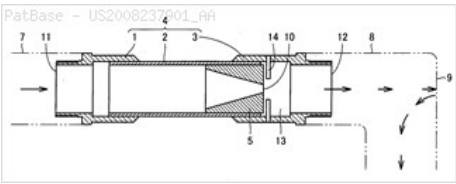
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International (IPC 1-7): B01F5/04 B05B1/04 C02F3/22 C02F7/00

CPC: Y02W10/15 C02F7/00 B01F3/04099 B01F5/0413 B01F2215/0052

European: B01F3/04C B01F5/04C12 C02F7/00 L01F215/00A62

US: 210/198.1 210/198.100S 261/76 261/76P 261/DIG.075 261/DIG.75 261/DIG.75S



Family:

Publication number	Publication date	Application number	Application date
DE112005000663 T5	20070215	DE200511000663	20050127
JP2005288222 A2	20051020	JP20040103324	20040331
JP4439971 B2	20100324	JP20040103324	20040331
TW200531935 A	20051001	TW20050102862	20050131
US2008237901 AA	20081002	US20050594675	20050127
WO05100269 A1	20051027	WO2005JP01060	20050127

Priority:

JP20040103324 20040331 WO2005JP01060 20050127

Probable Assignee: SENOO NAOHITO

Assignee(s): (std): SENOO ARIHITO ; SENOO MASAO ; SENOO NAOHITO ; SENOO TAKEO

Inventor(s): (std): SENOO TAKEO ; SENOO MASAO

Agent(s): BIRCH STEWART KOLASCH AND BIRCH

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 KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE 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

Title: METHOD FOR PURIFYING **WATER** FOR ECONOMY AND DRINKING **WATER** SUPPLYING AND **APPARATUS** FOR EFFECTUATING THE SAME

Abstract: Source: RU2282594C

FIELD: **purification** of ground **water** from iron, manganese, copper and other metals and simultaneously removal of hydrogen sulfide and other hazardous gases, in particular, supplying of cities, populated localities, individual objects and agricultural complexes with **water**.

SUBSTANCE: method involves vacuumizing and mixing **water** stream to be purified with air by dispersing **water** with air; feeding **water**-and-air mixture into casing containing non-immersed filtering charge; providing separate discharge of purified liquid stream and air; performing vacuumizing process by feeding liquid stream under pressure into converging tube equipped with Venturi nozzles; separating stream in converging tube and directing through Venturi nozzles; continuously ejecting air from environment and performing filtering of purified **water** during free flowing thereof. Mixer with air sucking apertures is positioned concentrically at the outer side of converging tube. Outer part of converging tube surface is defined by uniting side surfaces of a number of truncated cones whose bases are extending in two parallel planes, and centers of these bases are apexes of regular polygons.

EFFECT: increased efficiency in removal from **water** under **purification** process of inorganic difficult-to-oxidize substances and organic substances, and reduced number of **purification** steps.

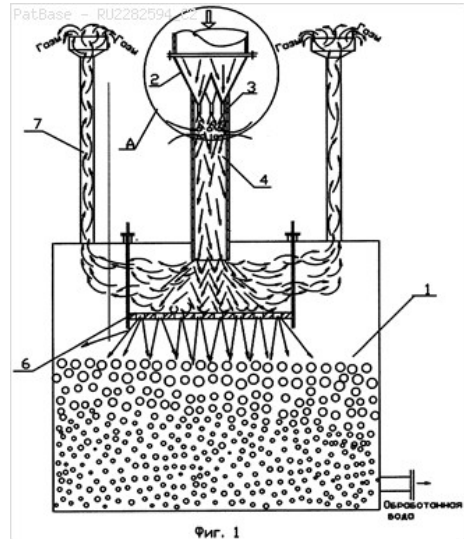
3 cl, 2 dwg, 2 tbl

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 (Advanced/Invention);

B01F3/04 C02F1/74 (Core/Invention)

International (IPC 1-7): B01F3/04 C02F1/74



Family:

Publication number	Publication date	Application number	Application date
RU2004120763 A	20051220	RU20040120763	20040707
RU2282594 C2	20060827	RU20040120763	20040707

Priority:

RU20040120763 20040707

Probable Assignee: GAMARNIK VLADIMIR GRIGOR EVICH

Assignee(s): (std): GAMARNIK VLADIMIR GRIGOR EVICH ; VOL SKAJA OL GA NIKOLAEVNA ; ZAPOROZHTSEVA NATALIJA ANATOL

Assignee(s): ZAPOROZHTSEVA NATALIJA ANATOL EVNA

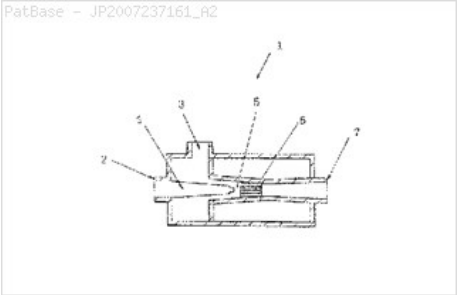
Inventor(s): (std): GAMARNIK VLADIMIR GRIGOR EVICH ; VOL SKAJA OL GA NIKOLAEVNA ; ZAPOROZHTSEVA NATALIJA ANATOL

Inventor(s): ZAPOROZHTSEVA NATALIJA ANATOL EVNA ; ZAPOROZHTSEVA NATALIJA ANATOL'EVNA ; VOL'SKAJA OL'GA NIKOLAEVNA ; GAMARNIK VLADIMIR GRIGOR'EVICH

Title: METHOD AND DEVICE FOR PRODUCING HYDROGEN-INCORPORATED **WATER**

Abstract: Source: JP2007237161A PROBLEM TO BE SOLVED: To provide hydrogen-incorporated **water** whose pH is normal and oxidation-reduction potential is -400 mV to -680 mV, containing a large amount of minute hydrogen bubbles whose size is 2 micro m to 120 micro m. SOLUTION: A device for producing the hydrogen-incorporated **water** comprises a closed tube with two openings at both ends and a diffusion chamber within the closed tube in a double tube construction, containing therein a porous stainless-steel element with its porosity of 200 mesh (0.074 mm) and thickness of 10 mm. The closed tube is supplied with running **water** whose oxidation-reduction potential is 357 mV, pH 7.25, temperature 13.2 degrees centigrade, pressure 0.2 MPa and flowing rate 15 L/minute to mix with hydrogen gas also supplied into the closed tube and adjusted to have pressure of 0.25 MPa and flowing rate of 0.5 L/minute, and thus the mixture passes the porous element to diffuse in the diffusion chamber, thereby obtaining the hydrogen-incorporated **water** with its oxidation-reduction potential of -615 mV, dissolved hydrogen of 1.31 ppm, flowing rate of 10 L/minute, and temperature of 13.3 degrees centigrade and containing a large amount of minute bubbles with the diameter of 200 mesh (0.074 mm). If necessary, two or more of these hydrogen-incorporated **water** producing devices are employed in series.

Classifications:
International (IPC 8-9): B01F3/04 B01F5/04 C02F1/68
C02F1/74 (Advanced/Invention);
C02F1/68 C02F1/74 (Advanced/Non-invention);
B01F3/04 B01F5/04 C02F1/68 (Core/Invention)



Family:

Publication number	Publication date	Application number	Application date
JP2007237161 A2	20070920	JP20060317740	20061124
JP3984279 B2	20071003	JP20060317740	20061124
KR100803832 B1	20080214	KR20060107406	20061101
KR20070081077 A	20070814	KR20060107406	20061101

Priority:
JP20060064854 20060209 JP20060317740 20061124

Probable Assignee: HIROSHIMA KASEI LTD
Assignee(s): (std): HIROSHIMA KASEI LTD
Inventor(s): (std): HARADA TOSHINORI ; HAYAMA TAKAHIRO ; MATSUI HISAKAZU ; MATSUI KYUICHI ; MATSUOKA DAIGO ; TAKAGAKI YUICHI ; TAKAGAKI YUICHI ; TAKEBE MAIKO

Title: METHOD AND DEVICE FOR FEEDING A GAS INTO A FLUID AT SUPERSONIC VELOCITY, AND USE OF THE METHOD

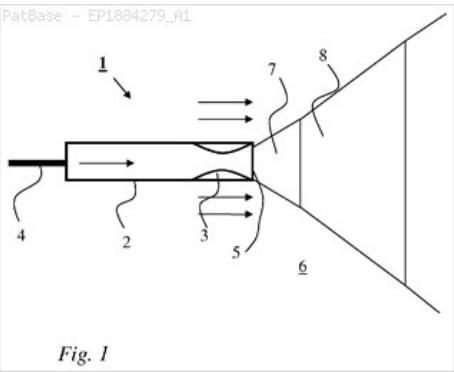
Abstract: The introducing of a gas into a liquid (6) for the vitalization of a **purification** basin or a natural or artificial **waters** or for aeration of a drinking **water** pipeline, comprises introducing the gas beneath the liquid surface from an injector (2) with ultrasonic speed into the liquid, producing an ultrasonic field (7) in the liquid by injection of the gas, and carrying out the injection of the gas in sequential pulses. Oxygen or carbon dioxide is used as gas and an aqueous liquid is used as liquid. An independent claim is included for a device for introducing a gas into a liquid.

Classifications:

International (IPC 8-9): B01F3/04 B01F5/02 B01F5/04 C02F1/72 C02F1/74 C02F3/02 C02F3/12 C02F7/00 (Advanced/Invention); B01F3/04 B01F5/02 B01F5/04 C02F1/72 C02F1/74 C02F3/02 C02F3/12 C02F7/00 (Core/Invention)

CPC: Y02W10/15 B01F3/0446 B01F3/04808 B01F5/0206 B01F13/0018 B01F15/00123 B01F15/00162 B01F15/00344 B01F15/0203 B01F15/0241 B01F2003/04865 B01F2003/04893 B01F2215/0052 C02F1/36 C02F1/727 C02F3/1294 C02F7/00

European: B01F15/00K B01F15/00K1F B01F15/00K60D B01F15/02B4 B01F15/02B40K2 B01F3/04C4 B01F3/04C8G B01F5/02B C02F1/36 C02F1/72S C02F3/12V6 L01F13/00K2 L01F215/00A62 L01F3/04C20B4 L01F3/04C20B6 M02F7/00



Family:

Publication number	Publication date	Application number	Application date
AT511916 E	20110615	AT20070113003T	20070724
DE102006036324 A1	20080207	DE200610036324	20060804
EP1884279 A1	20080206	EP20070113003	20070724
EP1884279 B1	20110608	EP20070113003	20070724

Priority:

DE200610036324 20060804

Probable Assignee: MESSER FRANCE SAS

Assignee(s): (std): MESSER FRANCE S A S ; MESSER FRANCE SAS

Inventor(s): (std): AMOUX STEPHANE ; ARNOUX STEPHANE ; GROGNET PHILIPPE ; GROGNET PHILLIPE ; MILAN EMMANUEL

Agent(s): MUENZEL JOACHIM R

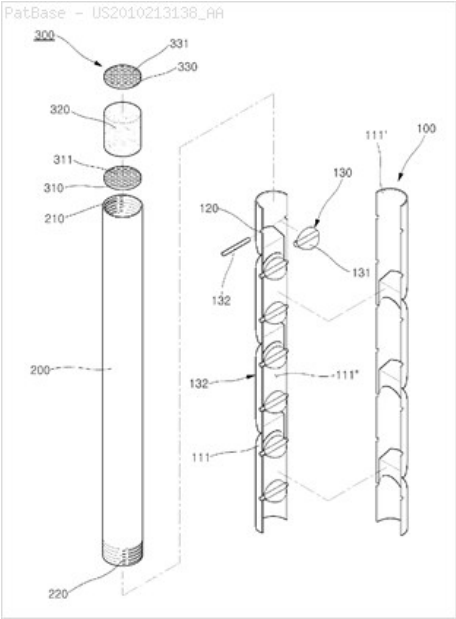
Designated states: AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL PL PT RO RS SE SI SK TR

Title: **WATER**-PURIFYING **APPARATUS** GENERATING ANIONS AND PROCESSING METHOD THEREOF

Abstract: Source: US2010213138A **Water**-purifying **apparatus** which generates anions and processing method thereof, which activates **water** through generating anions to obtain good quality purified **water** corresponding to pure life-giving **water**. Raw **water** introduced into the **water**-purifying **apparatus** is introduced into an inflow pipe formed in a zigzag shape and rotating units are rotated by flow rate of the introduced raw **water**, to raise a vortex phenomenon to generate bubbles. Accordingly, anion content and dissolved oxygen amount increases. Moreover, filter members filter poisonous impurities in the raw **water** to provide good quality purified **water**. Generation of bubbles and anions activates **water** to obtain good quality purified **water** healthy and appropriate for humans, and provide effects such as promoting environment improvement of **water** quality **purification** in the **water** quality **purification** field, promoting health improvement of treating and preventing diseases in the medical field, and promoting growth of animals and plants in the life science field.

Classifications:

International (IPC 8-9): A61K35/08 B01D35/00 B01F1/00 B01F3/04 B01F5/00 B01F7/00 B01J19/18 C02F1/20 C02F1/34 C02F1/46 C02F1/72 C02F1/74 C02F103/02 (Advanced/Invention); B01D35/00 C02F1/46 C02F103/02 (Advanced/Non-invention); A61K35/02 C02F1/20 C02F1/34 C02F1/72 (Core/Invention)
International (IPC 1-7): C02F1/20
CPC: C02F1/005 C02F1/74
European: C02F1/00M M02F1/74
US: 210/136 210/151 210/192 210/192S 210/205 210/262 210/758 210/764 366/280 366/290 366/300 422/225 422/228



Family:

Publication number	Publication date	Application number	Application date
CN101848866 A	20100929	CN200880104043	20080822
CN101848866 B	20121114	CN200880104043	20080822
EP2197797 A2	20100623	EP20080793417	20080822
EP2197797 A4	20111130	EP20080793417	20080822
IN00891DN2010 A	20100806	IN2010DN00891	20100209
JP2010536553 T2	20101202	JP20100521792T	20080822
JP5174168 B2	20130403	JP20100521792T	20080822
KR100822440 B1	20080416	KR20070085019	20070823
KR100878770 B1	20090114	KR20080025770	20080320
US2010213138 AA	20100826	US20080673938	20080822
US8398863 BB	20130319	US20080673938	20080822
WO09025520 A2	20090226	WO2008KR04905	20080822
WO09025520 A3	20090416	WO2008KR04905	20080822

Priority:
KR20070085019 20070823 KR20080025770 20080320 WO2008KR04905 20080822
WO2009KR04905 20090822

Probable Assignee: ZHAO TIANXING

Assignee(s): (std): CHO CHUN HAENG ; HAENG CHO CHUN ; JO CHEON HAENG ; ZHAO TIANXING

Inventor(s): (std): CHO CHUN HAENG ; HAENG CHO CHUN ; JO CHEON HAENG ; CHUN HAENG CHO

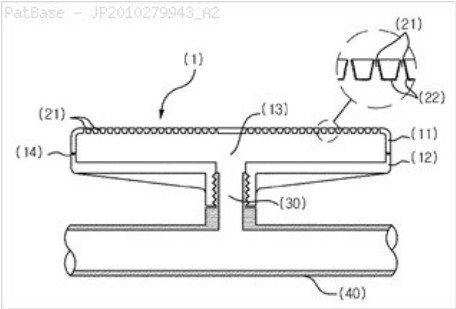
Agent(s): VOLLMANN HEIKO; NOVAK DRUCE AND QUIGG LLP; NOVAK DRUCE CONNOLLY BOVE AND QUIGG LLP; JO EUI JE

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 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 ZA ZM ZW

Title: AIR-DIFFUSING PIPE AND METHOD FOR MANUFACTURING THE SAME

Abstract: Source: JP2010279943A PROBLEM TO BE SOLVED: To provide an air-diffusing pipe for dispersing air supplied from a blower as fine bubbles in **water** to increase dissolved oxygen, and a method for manufacturing the same, with regard to a device for supplying dissolved oxygen to reaction tanks in facilities for treating sewage and waste **water**, lakes, ponds, rivers, fish farms, etc. to culture aerobic microorganisms, increase the self-cleaning ability of the **water** system, and culture fish and shellfish in a high density. SOLUTION: The air-diffusing pipe 1 is formed by strongly and integrally fusion-bonding two or more small bodies 11 and 12 molded of a thermoplastic synthetic resin, which include a plurality of fine air-diffusing ports 21 for generating fine bubbles in **water** and one or more air supply ports 30 through which air is supplied from a blower, and thus is excellent in the sealability of a bonding portion 14 and can stably maintain an oxygen transfer rate.

Classifications:
International (IPC 8-9): B01F3/04 B29C65/02 C02F1/74 C02F3/02 C02F3/20 C02F7/00 (Advanced/Invention);
B01F3/04 C02F1/74 C02F3/20 C02F7/00 (Advanced/Non-invention);
B01F3/04 C02F1/74 C02F3/20 C02F7/00 (Core/Invention)
CPC: Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
CN101905929 A	20101208	CN201010196414	20100602
CN101905929 B	20120704	CN201010196414	20100602
JP2010279943 A2	20101216	JP20100122024	20100527
KR100934587 B1	20091231	KR20090049298	20090604
KR20090069257 A	20090630	KR20090049298	20090604

Priority:

KR20090049298 20090604

Probable Assignee: GREEN ENGINEERING AND CONSTRUCTI

Assignee(s): (std): GREEN ENGINEERING AND CONSTRUCTI ; GREEN TECHNOLOGY CO LTD

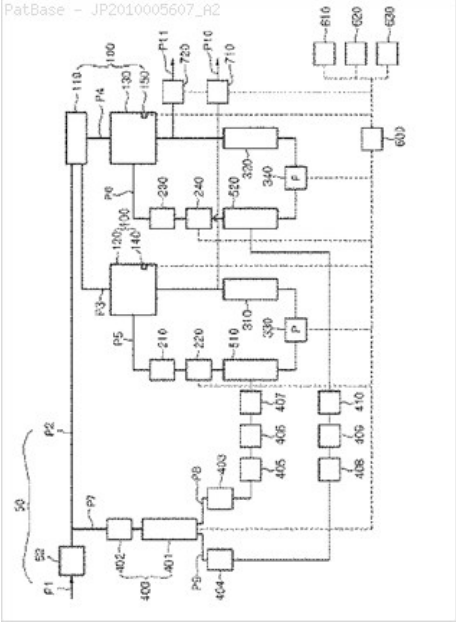
Assignee(s): GREEN ENGINEERING AND CONSTRUCTION CO ; GREEN TECHNOLOGY CO

Inventor(s): (std): HAN SANG BAE ; BAE HAN SANG

Title: SIMULTANEOUS PARALLEL MANUFACTURING **APPARATUS** AND MANUFACTURING METHOD OF FINE BUBBLE-CONTAINING HIGH CONCENTRATION OXYGEN **WATER** AND HYDROGEN **WATER**, USING OXYGEN GAS AND HYDROGEN GAS OF HIGH PURITY

Abstract: Source: JP2010005607A PROBLEM TO BE SOLVED: To provide a simultaneous parallel manufacturing **apparatus** and a manufacturing method of fine bubble-containing high concentration oxygen **water** and fine bubble-containing high concentration hydrogen **water**, rich in oxygen and hydrogen, respectively. SOLUTION: The simultaneous parallel manufacturing **apparatus** of fine bubble-containing high concentration oxygen **water** and hydrogen **water** using oxygen gas and hydrogen gas of high purity includes: oxygen gas and hydrogen gas forming units forming oxygen gas and hydrogen gas from supplied **water**; a first mixing part mixing the formed oxygen gas with **water** by passing them through a porous substance and generating fine bubbles; a second mixing part mixing the formed hydrogen gas with **water** by passing them through the porous substance and generating fine bubbles; a first dissolving part connected to the first mixing part, pressurizing the mixed fluid containing fine bubbles of oxygen gas and **water** to heighten the solubility of oxygen gas; a second dissolving part connected to the second mixing part, pressurizing the mixed fluid containing fine bubbles of hydrogen gas and **water** to heighten the solubility of hydrogen gas; and first and second storage tanks connected to the respective dissolving parts and storing oxygen **water** and hydrogen **water** discharged from the respective dissolving parts.

Classifications:
International (IPC 8-9): A47J31/00 B01F1/00 B01F3/04 B01F5/00 B01F5/06 C02F1/68 C02F1/74 (Advanced/Invention); B01F1/00 B01F3/04 B01F5/00 B01F5/06 C02F1/68 (Core/Invention)



Family:

Publication number	Publication date	Application number	Application date
JP2010005607 A2	20100114	JP20080310925	20081205
KR100980200 B1	20100903	KR20080059966	20080625
KR20100000454 A	20100106	KR20080059966	20080625

Priority:
KR20080059966 20080625

Probable Assignee: CUBE CO LTD L

Assignee(s): (std): CUBE CO LTD L ; KIM BEOM SU ; KIM CHEOL OK ; KIM HO GOENG ; UNISIA CO LTD

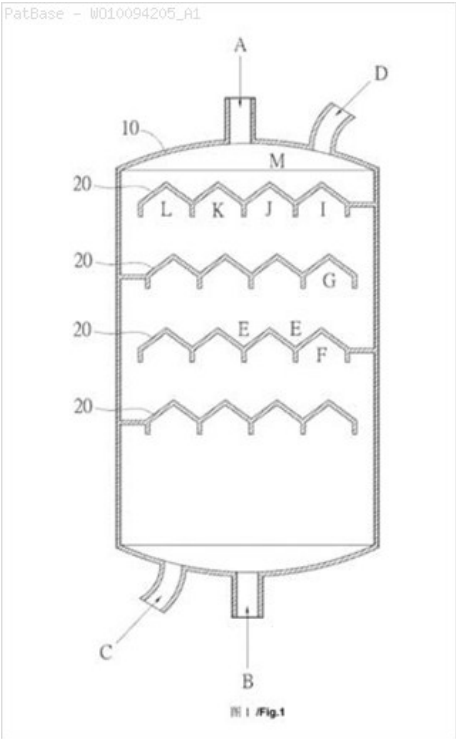
Assignee(s): L CUBE CO LTD

Inventor(s): (std): KIM BEOM SU ; KIM BOMSOO ; KIM CHEOL OK ; KIM HO GOENG

Title: **APPARATUS** FOR COUNTER-CURRENT EXCHANGE

Abstract: An **apparatus** for counter-current exchange comprises a container (10), in which at least one corrugated layer (20) for gas exchange is arranged with each corrugated layer (20) having at least one oxygen storage/exchange channel (E, F, G, I, J, K, L). In the upper part of the container (10), a **water** inlet (A) for injecting **water** into the container (10) and a gas outlet (D) for discharging gas having lower concentration of oxygen out of the container (10) are arranged. In the lower part of the container (10), a **water** outlet (B) for discharging **water** out of the container (10) and a gas inlet (C) for injecting pure oxygen into the container (10) are arranged. Thus, the **water** flows into the container (10) from the **water** inlet (A) and goes from the top down, whereas the oxygen flows into the container (10) from the gas inlet (C) and goes from the bottom up. The oxygen flows through each corrugated layer (20) and oxygen storage/exchange channels (E, F, G, I, J, K, L). By taking advantage of the **water** flow disturbance created by each corrugated layer (20), the oxygen is dissolved in the **water** naturally in the process of the **water** flowing from the top down, which at last flows out from the **water** outlet (B), and accordingly oxygen (O2)-enriched **water** is obtained.

Classifications:
International (IPC 8-9): B01F1/00 B01F3/04 B01F5/00 C02F1/00 C02F1/68 C02F1/74 (Advanced/Invention)
CPC: B01D3/20 C02F1/20
European: B01D3/20 C02F1/20



Family:

Publication number	Publication date	Application number	Application date
CN201389429 Y	20100127	CN200920009781U	20090220
JP3176220 U	20120614	JP20110600064U	20091229
WO10094205 A1	20100826	WO2009CN76184	20091229

Priority:
CN200920009781U 20090220 WO2009CN76184 20091229

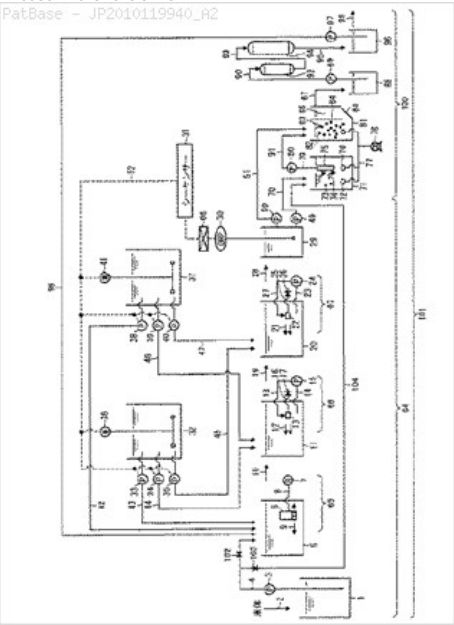
Probable Assignee: CHEN JIAN AN
Assignee(s): (std): CHEN JIAN AN ; JIANAN CHEN
Assignee(s): CHEN JIANAN
Inventor(s): (std): CHEN JIAN AN ; JIANAN CHEN
Inventor(s): CHEN JIANAN
Agent(s): BEIJING SAN GAO YONG XIN INTELLECTUAL PROPERTY AGENCY CO LTD
Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF 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 TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: **PURIFICATION APPARATUS** AND METHOD

Abstract: Source: JP2010119940A PROBLEM TO BE SOLVED: To produce an **apparatus** for purifying liquid to be treated using a nanobubble-containing liquid, at a low cost in a short time. SOLUTION: The **purification apparatus** 101 includes a microbubble generator 65 for producing a microbubble-containing liquid using **water** to be treated introduced into a microbubble generation tank 5, a micronanobubble generator 66 for producing a micronanobubble-containing liquid using the microbubble-containing liquid introduced into a micronanobubble generation tank 11, a nanobubble generator 67 for producing the nanobubble-containing liquid using the micronanobubble-containing liquid introduced into a nanobubble generation tank 20, and a **purification** means for purifying the introduced nanobubble-containing liquid, whereby the **apparatus** for purifying liquid to be treated using a nanobubble-containing liquid can be produced at a low cost in a short time.

Classifications:

International (IPC 8-9): B01D61/18 B01F3/04 C02F1/28 C02F1/44 C02F1/74 C02F3/06 C02F3/08 C02F3/12 C02F3/20 (Advanced/Invention); B01D61/18 B01F3/04 C02F1/28 C02F1/44 C02F1/74 C02F3/06 C02F3/08 C02F3/12 C02F3/20 (Core/Invention)
CPC: Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
JP2010119940 A2	20100603	JP20080294754	20081118
JP5037479 B2	20120926	JP20080294754	20081118

Priority:

JP20080294754 20081118

Probable Assignee: SHARP KK

Assignee(s): (std): SHARP KK

Assignee(s): SHARP CORP ; SHARP KABUSHIKI KAISHA

Inventor(s): (std): IWATA KOJI ; NAKAJO KAZUMI ; YAMAZAKI KAZUYUKI

Title: THE QUALITY OF WATER PURIFICATION EQUIPMENT OF ECO-FRIENDLY MOVING-TYPE USING SUNLIGHT

Abstract: Source: KR100986618B PURPOSE: A water purifying apparatus is provided to minimize power consumption by controlling the operation of a transfer propeller after confirming the existence of the wind. CONSTITUTION: A water purifying apparatus includes a solar module(16) in the outside, a frame part(10) which has a trapezoidal-shaped cross section where a plurality of floating spheres(12) are installed, a drive motor, a hollow type flow path part, a rotation screw transferring the water flowing into the inside of the flow path part to the upper, a transfer propeller transferring the frame part, a storage battery(60) storing electrical energy generated by the solar module, a first sensor(70) measuring the intensity of the fashion showing up, and an automatic controller(80) controlling the drive of the propeller and the motor by using electric energy.
Classifications:
International (IPC 8-9): B01F3/04 C02F1/74 C02F3/14 C02F7/00 (Advanced/Invention)
CPC: Y02W10/15

Family:

Publication number	Publication date	Application number	Application date
KR100986618 B1	20101008	KR20100025392	20100322

Priority:

KR20100025392 20100322

Probable Assignee: HYUN JIN CO LTD

Assignee(s): (std): HYUN JIN CO LTD

Assignee(s): HYUN JIN CO

Inventor(s): (std): IM YONG TAEK ; LIM A RUEM ; LIM SEUL GI ; YIM BO RAM

Title: ANTI-CLOGGING AERATION APPARATUS AND WATER PURIFICATION APPARATUS USING THE SAME

Abstract: Source: KR100986820B PURPOSE: A clogging prevention type high efficiency device and a water purifying device thereof are provided to prevent the block of a ventilation hole due to the sludge or deposits. CONSTITUTION: A clogging prevention type high efficiency device includes a surface fixture(10), a diffuser(20) located in the upper part of the fixture, a connection part(30) continuing the fixture and the diffuser, and a float(40) connected to the upper part of the diffuser. The diffuser of one air diffuser for the interconnection of each air diffuser includes an inlet connector(21a) receiving the air or the oxygen, a flexible hose(21) which includes an outlet side connector(21b) transferring the air or the oxygen, and a support frame consisting of a panel(23A,23B) in which a plurality of fixing grooves(23) are formed, which maintains a twisted hose shape.

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 C02F3/20 C02F7/00 (Advanced/Invention)

CPC: Y02W10/15

Family:

Publication number	Publication date	Application number	Application date
KR100986820 B1	20101012	KR20100007746	20100128

Priority:

KR20100007496 20100127

Probable Assignee: ECOBASE CO LTD

Assignee(s): (std): ECOBASE CO LTD

Assignee(s): ECOBASE CO

Inventor(s): (std): CHOI RANG KYU ; LEE JONG HYUK ; LEE JOO HYEUK ; OH IN SOON

Title: AERATION SYSTEM WITH ANTIMICROBIAL PROPERTIES

Abstract: Source: US2011198764A Aeration pipe for diffusion of a gas into a liquid medium, the pipe having a flexible microporous tubular wall of thermoset polymer particles and a thermoplastic binder for melt bonding said thermoset polymer particles and dispersing an antimicrobial compound substantially uniformly throughout the wall. The aeration pipe is useful in various environments such as aquaculture and waste **water** treatment.

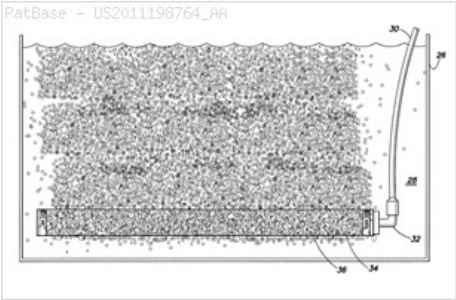
Classifications:

International (IPC 8-9): A01K63/04 A01N25/34 B01D65/08 B01D67/00 B01D69/04 B01D69/14 B01D71/26 B01F3/04 B29D22/00 C02F1/72 C02F1/74 C02F3/20 F16L11/12 (Advanced/Invention)

CPC: B01D2325/026 B01D2325/48 B01D69/04 A01K63/042 B01D65/08 B01D67/002 B01D69/141 B01D71/26 B01D2321/166 B01F3/04269 B01F2003/04319 B01F2003/04418 B29B7/88 C02F1/50 C02F3/201 Y02W10/15

European: A01K63/04A B01D65/08 B01D67/00K16 B01D69/04 B01D69/14B B01D71/26 B01F3/04C1B2L B29B7/88 C02F1/50 C02F3/20B L01D321/16F L01F3/04C1B2T10 L01F3/04C1B2V2

US: 210/758 210/758S 210/764 210/764S 261/122.1 261/122.100P 264/45.9 264/45.900S



Family:

Publication number	Publication date	Application number	Application date
CN102811800 A	20121205	CN201180013704	20110218
US2011198764 AA	20110818	US20110030832	20110218
WO11103445 A1	20110825	WO2011US25458	20110218

Priority:
US20100305725P 20100218 US20110030832 20110218 WO2011US25458 20110218

Probable Assignee: SWAN HOLDINGS LLC

Assignee(s): (std): MITCHELL WILLIAM S ; TEKNI PLEX INC ; WILLIAMS ERICK BENJAMIN

Assignee(s): US BANK NATIONAL ASSOCIATION COLLATERAL AGENT AS ; THERESE A HENDRICKS ; PNC BANK NATIONAL ASSOCIATION ; SWAN HOLDINGS LLC

Inventor(s): (std): MITCHELL WILLAM S ; MITCHELL WILLIAM S ; WILLIAMS ERICK BENJAMIN

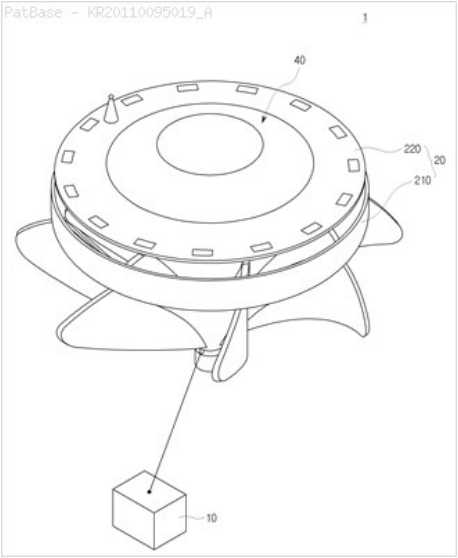
Agent(s): HENDRICKS THERESE A ET AL

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 TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

Title: **WATER PURIFICATION** DEVICE

Abstract: Source: KR20110095019A PURPOSE: A **water** purifying **apparatus** is provided to circulate **water** in a deep layer part to a surface layer part without the separate supply of power. CONSTITUTION: A weight(10) is installed at underwater. A housing includes an internal housing which is inserted into an external housing and is in connection with the weight to be floated. A driving part receives **water** to discharge **water** from the lower side of the external housing to the upper side. A solar cell module(40) supplies electric energy to the driving part. A spiral blade is installed at the external lateral side of the internal housing.

Classifications:
International (IPC 8-9): B01F3/04 C02F1/74 C02F3/14 C02F7/00 (Advanced/Invention)
CPC: Y02W10/37 Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
KR101171674 B1	20120806	KR20100014804	20100218
KR20110095019 A	20110824	KR20100014804	20100218

Priority:
KR20100014804 20100218

Probable Assignee: CHOI KUK HYUN

Assignee(s): (std): CHOI KUK HYUN

Inventor(s): (std): CHOI KUK HYUN

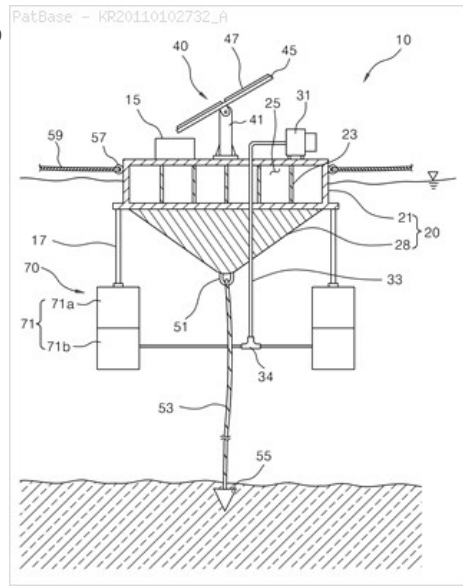
Title: FLOATING TYPE WATER TREATMENT FACILITY HAVING SELF-GENERATION FUCTION

Abstract: Source: KR20110102732A PURPOSE: A self-generating floating type water quality purifying apparatus is provided to improve the efficiency of water purification and to circulate water in various water depth layers by vertically moving a bio-reacting part. CONSTITUTION: A floating unit(20) and an aerating part are prepared. A self-generating unit(40) is installed in the floating unit to generate driving electricity required for driving a blower based on solar light or wind force. A power supplying part is charged with the driving electricity from the self-generating unit and supplies electricity to the blower. A movement limiting unit is in connection with the floating unit and limits the movement of the floating unit in the pre-set range of the surface of water.

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 C02F3/20 C02F7/00 (Advanced/Invention)

CPC: Y02W10/37 Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
KR101168372 B1	20120724	KR20100021895	20100311
KR20110102732 A	20110919	KR20100021895	20100311

Priority:

KR20100021895 20100311

Probable Assignee: SUNGHO GREENTECH CO LTD

Assignee(s): (std): SUNGHO GREENTECH CO LTD

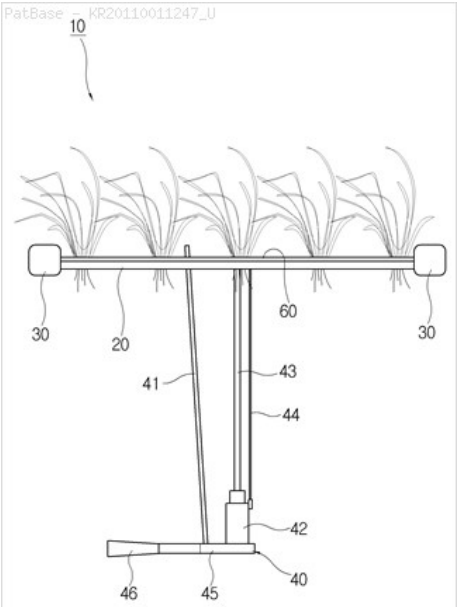
Assignee(s): SUNGHO GREENTECH CO

Inventor(s): (std): PARK WANG JAE

Title: **APPARATUS** FOR PURIFYING **WATER**

Abstract: Source: KR200461597Y The subject innovation relates to a **water purification** device, connected to a plurality of frames combined to form a lattice-like configuration and the upper part of the mobile frame is equipped with a man-made mat is receiving the Iris plants, aquatic plants, and the mobile frame The both sides and around the edges of the buoyant member is mounted to be raised to the **water** surface, and the air pipe to the bottom of the mobile frame, the inflow of outside air, **water** motor which one end is connected to the support pipe and the support line is fixed to the mobile frame and a motor connected with the **water** and air pipes made of the valves, including the attached misegi package consisting mixing air and **water** during operation of the **water** motor in the injector for generating a micro-bubble activity from the exhaust vent to be mounted on the front It characterized.In accordance with the subject innovation, which is located in the **water** with the value misegi packing able to inhibit or reduce the phytoplankton and nitrogen such as a lake or reservoir or dam, but also there is an effect capable of suppressing the birds through a large amount of oxygen supply.

Classifications:
International (IPC 8-9): B01F3/04 C02F1/74 C02F3/20 C02F7/00 (Advanced/Invention)
CPC: Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
KR200461597 Y1	20120723	KR20100005611U	20100528
KR20110011247 U	20111206	KR20100005611U	20100528

Priority:
KR20100005611U 20100528

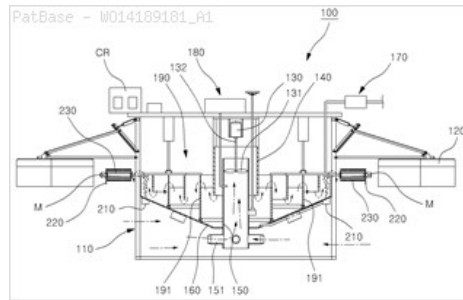
Title: **WATER PURIFICATION APPARATUS**

Abstract: The present invention relates to a **water purification apparatus**, which is capable of evenly mixing chemicals for purifying **water** in the procedure of artificially making **water** in lakes and marches be circulated, as well as enabling stable **water** circulation and adjustment of the circulation quantity during the circulation of **water**. In particular, the **water purification apparatus** forms a plurality of bubble injection nozzles connected in communication with an air supply pipe at the lower portion of a **water** circulation path of a partition positioned in the outermost side of the **water purification apparatus** so as to easily supply oxygen to the inside of the lakes and marshes due to the bubble creation by the bubble injection nozzles, thereby preventing occurrence of algal blooms and increasing the dissolved oxygen content in the lakes and marshes in order for the lakes and marshes to exhibit the environment-friendly **water purification** ability of the lakes and marshes. In addition, the **water purification apparatus** is capable of easily separating **water** and bubbles by a blocking partition installed to be apart from a partition positioned in the outermost side of a frame, and is capable of easily collecting and transporting bubbles discharged together with **water** to the outside of the frame by a bubble-transporting conveyor installed at the inner side of the blocking partition, thereby easily removing pollutants in the lakes and marshes, which have been adsorbed onto the bubbles.

Classifications:

International (IPC 8-9): B01F3/04 C02F1/74 C02F7/00 (Advanced/Invention)

CPC: C02F2209/005 C02F7/00 B01F3/04609 B01F5/0606 B01F13/0049 B01F15/00558 Y02W10/15



Family:

Publication number	Publication date	Application number	Application date
KR101280011 B1	20130628	KR20130057767	20130522
WO14189181 A1	20141127	WO2013KR08956	20131008

Priority:

KR20130057767 20130522

Probable Assignee: JANG SUNG HO

Assignee(s): (std): JANG SEONG HO ; JANG SUNG HO

Inventor(s): (std): JANG SEONG HO ; JANG SUNG HO

Agent(s): KOO EUNG HOI ET AL

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 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 JP KE KG KM KN KP 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