

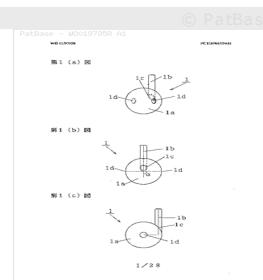
1) Family number: 15984381 (WO0197958 A1)

FINE AIR BUBBLE GENERATOR AND FINE AIR BUBBLE GENERATING DEVICE WITH THE GENERATOR

Abstract: Source: WO0197958 A1 A fine air bubble generator capable of preventing the clogging of reactants and waste materials by producing a large amount of fine air bubbles in the water of water tanks, pools, rivers, lakes and marshes, or dams, in the water (sea water) of cultivating ponds, coastal farms, or fresh fish carriers, or in the liquid of air-liquid reaction vessels in chemical plants and a fine air bubble generating device capable of providing an excellent productivity by efficiently producing a large amount of fine air bubbles; the fine air bubble generator (1), comprising a generator body (1a) having a hollow part formed generally in rotation symmetry, an air-liquid inlet hole (1c) opened in the peripheral wall part of the generator body (1a) in a tangential direction, and air-liquid blowing holes (1d) provided in the generator body in the direction of the rotation symmetry axis of the hollow part.

Probable Assignee: SAITO YOSHIRO

Earliest Publication Date: 20011227



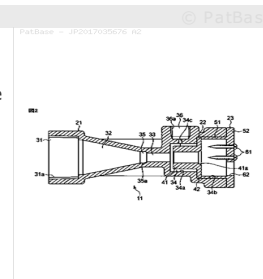
2) Family number: 65088432 (JP2017035676 A2)

FINE AIR BUBBLE GENERATING DEVICE AND FINE AIR BUBBLE GENERATING SYSTEM

Abstract: Source: JP2017035676 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generating device and a fine air bubble generating system capable of increasing an intake amount of gas with a simple constitution.SOLUTION: A fine air bubble generating device 11 used in a fine air bubble generating system 1 includes: a body 21 which has a tapered part 32 allowing an inner diameter thereof to be gradually reduced, a nozzle part 33 provided on the secondary side of the tapered part 32 and having an inner diameter formed with the same diameter, an end surface 35a provided between the tapered part 32 and the nozzle part 33, opposite to water flow direction, and an enlarged diameter part 34 provided on the secondary side of the nozzle part 33, having an inner diameter formed in a larger diameter than the nozzle part 33; a suction pipe 24 connected to the enlarged diameter part 34; a diffuser 22 provided on the enlarged diameter part 34; and a crushing member 23 provided on an end part of the enlarged diameter part 34, having a crushing means 61 for crushing gas sucked from the suction pipe 24.SELECTED DRAWING: Figure 2

Probable Assignee: KAWAMOTO PUMP MFG

Earliest Publication Date: 20170216



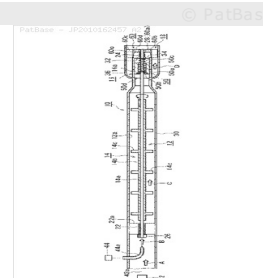
3) Family number: 46554610 (JP2010162457 A2)

FINE AIR BUBBLE GENERATING NOZZLE AND FINE AIR BUBBLE GENERATING APPARATUS

Abstract: Source: JP2010162457 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generating nozzle that efficiently generates fine air bubbles. SOLUTION: The fine air bubble generating nozzle includes a gas-liquid mixing section 12 that mixes a liquid and a gas, a stirring member 14 disposed inside the gas-liquid mixing section 12, and a delivering section 16 that delivers a gas-liquid mixing fluid from the gas-liquid mixing section 12, and further includes a driving mechanism 18 that drives the stirring member 14 by the fluid energy of the gas-liquid mixing fluid delivered from the delivering section 16.

Probable Assignee: LWJ KK

Earliest Publication Date: 20100729

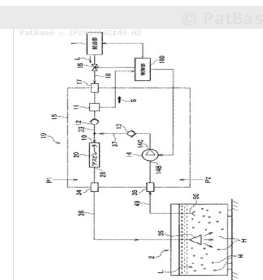


4) Family number: 46554429 (JP2010162149 A2)

FINE AIR BUBBLE GENERATING DEVICE FOR BATHTUB AND METHOD OF GENERATING FINE AIR BUBBLES FOR BATHTUB

Abstract: Source: JP2010162149 A2 PROBLEM TO BE SOLVED: To provide an inexpensive fine air bubble generating device for a bathtub and an inexpensive method of generating fine air bubbles for the bathtub which can increase the number of fine air bubbles by mixing hot water within the bathtub with fine air bubbles such as a microbubble and moreover circulating hot water containing the fine air bubbles. SOLUTION: The fine air bubble generating device 10 for the bathtub has a fine air bubble generator 20, which is connected with the bathtub 2 and forms fine air bubbles H by tension opening by decompressing the hot water L which is supplied to the bathtub 2, and a circulation part which sends the hot water L containing the fine air bubbles H within the bathtub 2 to the inside of the bathtub 2 by making it pass again through the fine air bubble generator 20 and increases the number of the fine air bubbles by mixing the hot water within the bathtub with the fine air bubbles such as the microbubble and moreover circulating the hot water containing the fine air bubbles.

Probable Assignee: SHIBAURA MECHATRONICS CORP

Earliest Publication Date: 20100729

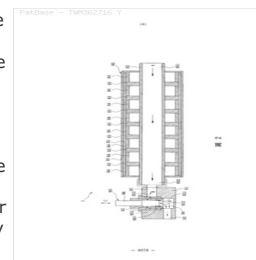
5) Family number: 43949544 (TWM362716 Y)

DEVICE FOR GENERATING ULTRA-FINE BUBBLES

Abstract: Source: TWM362716 Y One kind of ultra tiny air bubble has the installment, it is the connection installs pipeline of in on the water supply system uses, this water supply system contains a pump, import end connection water inlet pipe road this pump inducts in the water trough, this water inlet pipe road connects an air intake system import end side in the pump, this pump exports the end connects and forms the circuit using the connection pipeline and the pressure tube, but this pressure tube inducts in the water trough because of the discharging piping; When ? moves the pump, in the water trough the water by the water inlet pipe road inspiration pump in, then has a negative pressure suction effect to pipeline of the air intake system, so as to the attraction outside air enters water inlet pipe Lu Yi and the water mix by way of the air intake system, again together enters the pump compression mix, again by way of connects the pipeline to enter in the pressure tube to form the tiny air bubble intermixture, but inducts in the water trough because of the discharging piping, may supply to bathe the clean use; Its characteristic lies in: Establishes an ultra tiny air bubble pipeline of in on the water supply system to have the installment, it contains a magnetizer, exportation of side this magnetizer connects an ultra tiny air bubble controller, by carries on the magnetization and to the tiny air bubble intermixture slight forms the hydron the ultra tiny air bubble intermixture, increases the penetrability, because of adjusts the ultra tiny air bubble controller to be possible to have the high potency the ultra tiny air bubble, promotes the skin the absorption effect, then achieves the cutin the clean effect.

Probable Assignee: CHEN WEN PINGTW

Earliest Publication Date: 20090811



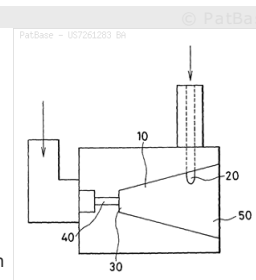
6) Family number: 14929274 (US7261283 BA)

SWING TYPE FINE AIR BUBBLE GENERATING DEVICE

Abstract: Source: US7261283 BA The swirling type micro-bubble generating system according to the present invention possesses a container main unit having a cylindrical space with bottom or a frusto-conically shaped space, a liquid inlet provided in a tangential direction on a part of a circumferential surface of an inner wall of said space, a gas introducing hole provided on the bottom of said cylindrical space or opening of said frusto-conically shaped space, and a swirling gas-liquid mixture outlet arranged at the opposite end of said cylindrical space or opening of said frusto-conically shaped space. According to this system, it is possible to readily generate micro-bubbles in an industrial scale, and the system is relatively small in size and has simple structure and can be easily manufactured. The system can be used in applications such as purification of water quality in ponds, lakes, marshes, man-made lakes, rivers, etc., for processing of polluted water using microorganisms, culture of fishes and other aquatic animals, and increase of oxygen and dissolved oxygen in culture solution in hydroponics culture farm and improvement of production yield.

Probable Assignee: OHNARI HIROFUMI

Earliest Publication Date: 20001123



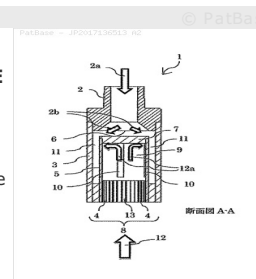
7) Family number: 66716778 (JP2017136513 A2)

FINE AIR BUBBLE GENERATING DEVICE, FINE AIR BUBBLE GENERATING METHOD, AND SHOWER DEVICE AND OIL WATER SEPARATING APPARATUS HAVING THE FINE AIR BUBBLE GENERATING DEVICE

Abstract: Source: JP2017136513 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generating device which is excellent in handleability, operability and durability by utilizing preparation of revolution flow due to pressurized liquid jetting and by simplifying configuration and structure, to provide a fine air bubble generating method capable of air bubbles in large amount, and to provide a shower device and an oil water separating apparatus having the fine air bubble generating device. SOLUTION: A fine air bubble generating device 1 includes: an inner cylinder 5 which has an air liquid revolution chamber 9 on an inner part thereof; an outer cylindrical container 3 of a double cylindrical structure which allows the inner cylinder 5 to be inserted to an inner part thereof; and a liquid supply cylinder 2 provided with a liquid introduction port 6 for introducing liquid to the outer cylindrical container 3. Therein, the inner cylinder 5 includes an end part 7 which is closed on the side of the liquid supply cylinder 2, an end part 8 which is opened on the side opposite to the liquid supply cylinder, and a through-slit 10 or a through-hole formed on the way from one end of the liquid supply cylinder 2 side to the middle in the longitudinal direction of the cylinder 5, and is integrated with the outer cylindrical container 3 so as to provide a gap 11 between an outer wall of the inner cylinder 5 of a part formed of the through-slit 10 or through-hole and an inner wall of the outer cylindrical container 3. SELECTED DRAWING: Figure 2

Probable Assignee: SIGMA TECH KK

Earliest Publication Date: 20170810



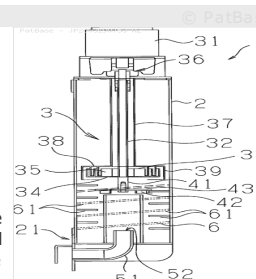
8) Family number: 28866112 (JP2003190753 A2)

FINE AIR BUBBLE FEEDER

Abstract: Source: JP2003190753 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble feeder capable of efficiently feeding only fine air bubbles B2. SOLUTION: The fine air bubble feeder comprises an air bubble generation tank 2 having a discharge port 21 opened to the lower part thereof, an impeller part 3 constituted by allowing stirring fins 33 and the outside of the air bubble generation tank 2 to communicate with each other by an air passing cylinder 32 and capable of generating air bubbles containing fine air bubbles B2 by the air supplied from the outside of the air bubble generation tank 2 through the air passing cylinder 32 by rotating the stirring fins 33 in polluted water, a turbine 4 for generating water streams by rotating the disc which is provided on the same axis as the rotary shaft of the impeller part 3 under the impeller part 3 and has a plurality of blades 42 fixed to the undersurface thereof, the flow distribution cylinder 5 provided under the turbine 4 and formed into a cylindrical shape having a lower end opening forming the water feed port 52 to the air bubble generation tank 2 and the air bubble guide plate 6 comprising a plate-shaped body and spirally fixed to the inside surface of the air bubble generation tank 2.

Probable Assignee: TEKKU KOGYO KK

Earliest Publication Date: 20030708



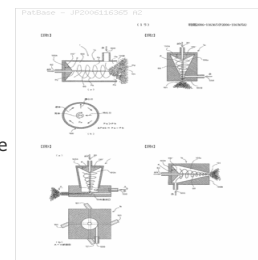
9) Family number: 33068867 (JP2006116365 A2)

REVOLVING TYPE FINE AIR BUBBLE GENERATOR AND FINE AIR BUBBLE GENERATING METHOD

Abstract: Source: JP2006116365 A2 PROBLEM TO BE SOLVED: To provide a revolving type fine air bubble generator capable of efficiently forming a large amount of fine air bubbles by a simple structure. SOLUTION: In the revolving type fine air bubble generator composed of a container body having a cylindrical space closed on its one end side by a wall body and opened on its other end side, air introducing holes opened in the wall body on one end side of the cylindrical space and a pressurized liquid introducing holes opened in a part of the circumferential surface of the inner wall of the cylindrical space in the tangential direction of the circumferential surface, one end side of the cylindrical space is formed into a conical shape or a truncated cone shape protruded toward the other end side of the cylindrical space and the space shape of the vertical cross section on one end side of the cylindrical space is formed into an M shape to lead a revolving air-liquid mixture liquid containing fine bubbles out of the opening part of the cylindrical space on its other end side. The angle of inclination of the wall body having the conical shape or the truncated cone shape is preferably 10-70 degrees, especially preferably 30-45 degrees.

Probable Assignee: NANOPLANET KENKYUSHO KK

Earliest Publication Date: 20060511



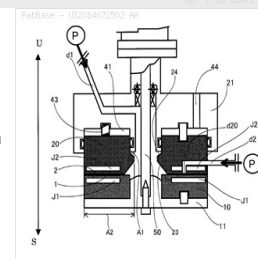
10) Family number: 52535232 (US2014072502 AA)

FINE BUBBLE GENERATING APPARATUS, METHOD FOR GENERATING FINE BUBBLES, AND METHOD FOR GAS-LIQUID REACTION USING SAME

Abstract: Source: US2014072502 AA The present invention addresses the problem of: providing an apparatus and method for generating fine bubbles in a plurality of processing surfaces in a plurality of processing members disposed in opposition so as to be capable of being brought together and moved apart, at least one being capable of relative rotation with respect to the other; as well as providing a method for reacting fine bubbles using a method for generating fine bubbles. Provided are: a plurality of processing members disposed in opposition so as to be capable of being brought together and moved apart, at least one being capable of relative rotation with respect to the other; processing surfaces provided in mutually opposed positions in the respective processing members; and at least two independent flow path communicating with the space between the processing surfaces. A gas and a liquid representing a fluid to be processed are introduced into the space between the processing surfaces from the at least two independent flow path, and the fluid is processed. The liquid is introduced from one flow path of at least two independent flow path, and the gas is introduced through the other flow path, whereby bubbles are generated between the processing surfaces.

Probable Assignee: M TECHNIQUE CO LTD

Earliest Publication Date: 20121206



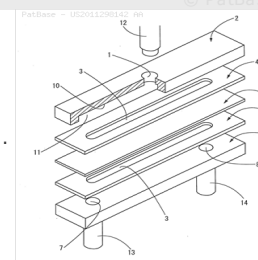
11) Family number: 44892943 (US2011298142 AA)

MICRO-BUBBLE GENERATING DEVICE

Abstract: Source: US2011298142 AA A micro-bubble generating device is provided which is capable of mixing or dispersing micro-bubbles into a liquid with high stability and has a simple structure that permits reduction of a cost of manufacture. A first member and a first packing are superposed on each other on one side of a gas-permeable film, while a second member and a second packing are superposed on each other on the other side of the gas-permeable film. A pressurized gas delivered via a gas inlet of the first member flows through a fluid passage of the first packing, permeates through the gas-permeable film, and is ejected as micro-bubbles into a liquid flowing through a fluid passage in the form of a narrow shallow strip-like groove provided in the second packing.

Probable Assignee: NAKASHIMA KOGYO CORP

Earliest Publication Date: 20100325



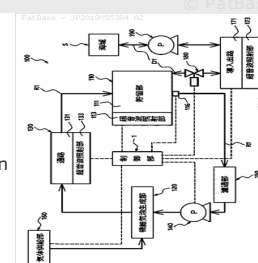
12) Family number: 74173091 (JP2019055384 A2)

FINE AIR BUBBLE STERILIZATION SYSTEM, AND METHOD FOR STERILIZATION OF SEAFOOD, BEVERAGE AND FOOD PRODUCT

Abstract: Source: JP2019055384 A2 To efficiently sterilize an object to be sterilized by use of ultrasonic wave for generating ultra-fine air bubbles for the purpose of sterilization. SOLUTION: A fine air bubble sterilization system comprises: a fine air bubble generation part which generates fine air bubbles in a liquid; a storage part for storing the liquid; a passage interposed between the fine air bubble generation part and the storage part; a first ultrasonic irradiation part which is provided in the passage, and irradiates the liquid, which contains fine air bubbles and passes the passage, with ultrasonic wave, thereby collapsing fine air bubbles and generating ultra-fine air bubbles; and a second ultrasonic irradiation part which is provided in the storage part, and irradiates the liquid, which contains fine air bubbles and is introduced into the storage part, with ultrasonic wave, thereby collapsing fine air bubbles and generating ultra-fine air bubbles. In this air bubble sterilization system, a circulation path for circulating the liquid is formed by the storage part, the fine air bubble generation part and the passage, and an object to be sterilized is introduced into the storage part. SELECTED DRAWING: Figure 1

Probable Assignee: TOSSLEC KK

Earliest Publication Date: 20190411



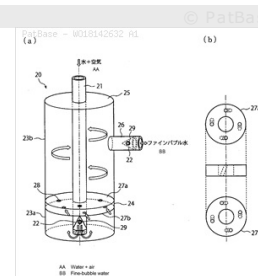
13) Family number: 70483944 (WO18142632 A1)

COMPOSITION FOR FINE-BUBBLE GENERATION AND GENERATION DEVICE

Abstract: Source: WO18142632 A1 The present invention pertains to an aqueous composition for generating fine-bubbles having desired properties, and a fine-bubble generation device. More specifically, the present invention pertains to an aqueous composition for generating fine-bubbles having properties suitable for use in cleaning, and a small, low-cost fine-bubble generation device in which no equipment such as a large pump is required. Furthermore, the present invention pertains to a cleaning method using fine-bubbles generated using said aqueous composition and/or fine-bubble generation device.

Probable Assignee: KINBOSHI INC

Earliest Publication Date: 20180704



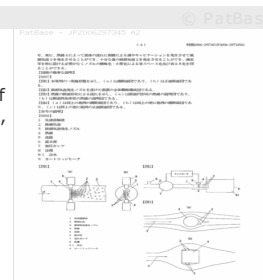
14) Family number: 34002651 (JP2006297345 A2)

FINE AIR BUBBLE GENERATING NOZZLE

Abstract: Source: JP2006297345 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generating nozzle capable of generating the sufficient amount of fine air bubbles by undissolving the dissolved gas of a gas-dissolved liquid by heating, and saving space and energy by simplifying and miniaturizing the nozzle. SOLUTION: In the fine air bubble generating nozzle 3 for generating the fine air bubbles 2 by undissolving the dissolved gas in the gas-dissolved liquid 1, a hot wire 4 is provided so as to cross the flow direction of the gas dissolved liquid 1.

Probable Assignee: MATSUSHITA ELECTRIC WORKS LTD

Earliest Publication Date: 20061102



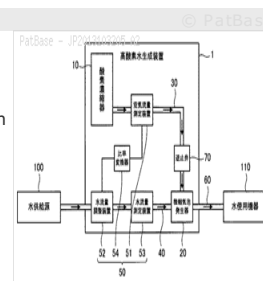
15) Family number: 54178246 (JP2013103205 A2)

HIGH CONCENTRATION OXYGEN WATER PRODUCTION APPARATUS, HIGH CONCENTRATION OXYGEN WATER WATERING APPARATUS, AND HIGH CONCENTRATION OXYGEN WATER PRODUCTION METHOD

Abstract: Source: JP2013103205 A2 PROBLEM TO BE SOLVED: To provide a high concentration oxygen water production apparatus having even a simple structure at low cost that can efficiently and simply producing high concentration oxygen water, and to provide a high concentration oxygen water watering apparatus and a high concentration oxygen water production method. SOLUTION: The high concentration oxygen water production apparatus 1 includes: an oxygen concentrator 10 for generating oxygen concentrated air; a fine air bubble generator 20 for generating fine air bubbles in water; an air introducing pipe 30 connected to the oxygen concentrator 10 and the fine air bubble generator 20; a water introducing pipe 40 connected to a water supply source 100 and the fine air bubble generator 20; a supply pipe 60 connected to the fine air bubble generator 20 and an equipment using water 110; and a flow volume adjusting device 50 for adjusting the flow volume of the oxygen concentrated air and the water supplied to the fine air bubble generator 20 to become the predetermined ratio.

Probable Assignee: ICST KK

Earliest Publication Date: 20130530



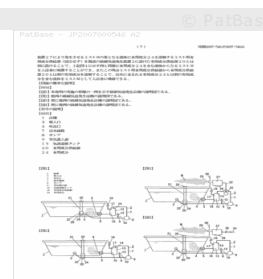
16) Family number: 34217288 (JP2007000546 A2)

FINE AIR BUBBLE GENERATING BATHTUB

Abstract: Source: JP2007000546 A2 PROBLEM TO BE SOLVED: To put bath water containing fine air bubble in which enough useful components dissolve to a bathing person and efficiently give favorable effects of the useful components to the bathing person. SOLUTION: An intake 3 and an outlet 4 are mounted on the inner surface of a bathtub 1 and connected through a bath water path 7, and a pump 8 is mounted on the half way of the bath water path 7 for sucking bath water from the intake 3 and discharging from the outlet 4. A dissolving part is mounted on the downstream side from the pump 8 of the bath water pass 7. A supplying means is mounted for supplying useful components 24 which are mixed or dissolved in the dissolving part and have favorable effects to a human body.

Probable Assignee: MATSUSHITA DENKO BATH AND LIFE

Earliest Publication Date: 20070111



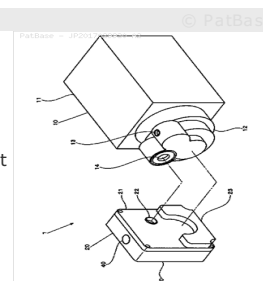
17) Family number: 64980238 (JP2017029930 A2)

FINE AIR-BUBBLE GENERATING DEVICE

Abstract: Source: JP2017029930 A2 PROBLEM TO BE SOLVED: To provide a fine air-bubble generating device which makes air-bubbles fine in two stages, thereby, efficiently generates the fine air-bubbles and can improve the degree of freedom of an installation place. SOLUTION: A fine air-bubble generating device includes: a housing inflow port which is disposed on an outer surface of a housing and causes a gas-liquid mixture to flow-in therethrough; a housing outflow port which is disposed on the outer surface of the housing and causes the gas-liquid mixture containing air bubbles made fine to flow-out therethrough; a distributor provided on an inner part of the housing; a plurality of swirlers; and a collection passage. Therein, the distributor includes a distribution cylinder part in which the housing inflow port is connected to one side end part in the axial direction thereof and a plurality of swirling outflow ports through which the gas-liquid mixture is caused to flow-out, each of the swirlers includes a swirling cylinder part which has both ends closed by end walls and an inner surface constituted in a cylindrical shape and connects the partition outflow port such that the gas-liquid mixture flows-in to the inner circumferential wall thereof from the tangential direction and a swirling outflow port which is provided substantially on a center of the end wall and causes the gas-liquid mixture to flow out therethrough, and the collection passage is communicated with the plurality of swirling outflow ports and are connected with the housing outflow port. SELECTED DRAWING: Figure 1

Probable Assignee: PRINCIPLE KK

Earliest Publication Date: 20170209



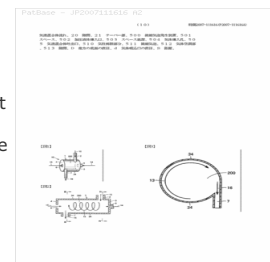
18) Family number: 34589914 (JP2007111616 A2)

FINE AIR-BUBBLE GENERATING DEVICE

Abstract: Source: JP2007111616 A2 PROBLEM TO BE SOLVED: To provide a fine air-bubble generating device which enables a discharge of only fine air bubbles, reduces a pressure loss of a fluid, and reduces noises produced when fine air bubbles are generated. SOLUTION: The fine air-bubble generating device is provided with a container 1 having a space capable of producing a rotational flow, a pressurized liquid inlet 2 provided at a side surface of the container 1 so as to guide a pressurized liquid producing the rotational flow inside the space 200, into the container 1, a gas suction port 5 provided on one bottom face 3 of the container 1 so as to guide a gas into the space 200, a liquid suction port 6 provided on the other bottom face 4 of the container 1 so as to guide a liquid into the space 200, and a gas-liquid mixture discharge port 7 provided on the container 1 so as to discharge a gas-liquid mixture where the gas and the liquid are mixed from the space 200 to the outside.

Probable Assignee: SHARP KK

Earliest Publication Date: 20070510



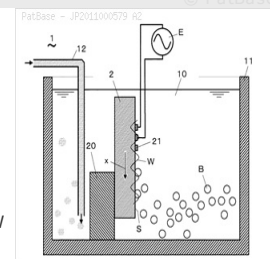
19) Family number: 48207000 (JP2011000579 A2)

METHOD FOR GENERATING FINE AIR BUBBLE BY USING SURFACE ACOUSTIC WAVE AND FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2011000579 A2 PROBLEM TO BE SOLVED: To make a fine air bubble generator have a simple and compact appliance configuration and make a method for generating fine air bubble and the fine air bubble generator applicable for various kinds of liquids with few limits of physical properties of the liquids and capable of stably generating fine air bubbles. SOLUTION: The method involves installing a piezoelectric substrate 2 having a plurality of comb-teeth-like electrodes 21 for oscillating surface acoustic wave W in the surface S in a liquid 10, oscillating surface acoustic wave W in the surface S by the electrode 21, and generating fine air bubbles B in the liquid 10 with surface acoustic wave W transmitted on the surface S in the liquid 10. Since the fine air bubbles B are generated with the surface acoustic wave W transmitted on the surface S of the piezoelectric substrate 2 in the liquid 10, any appliance for carrying out mechanical operation such as a high pressure pump to be used for generating swirling current and generating shearing force is unnecessary and fine air bubbles can stably be generated with a simple and compact appliance configuration.

Probable Assignee: PANASONIC ELECTRIC WORKS CO LTD

Earliest Publication Date: 20110106



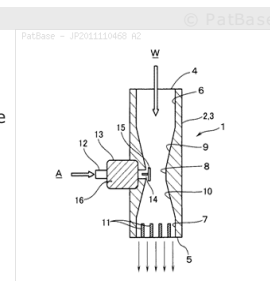
20) Family number: 49305075 (JP2011110468 A2)

DEVICE FOR GENERATING FINE AIR BUBBLE

Abstract: Source: JP2011110468 A2 PROBLEM TO BE SOLVED: To provide a device for generating fine air bubble capable of relatively enhancing oxygen concentration of air taken into water and simply generating fine air bubbles of the air of a high oxygen concentration in water. SOLUTION: The device 1 for generating fine air bubble includes an air supplying path 12 which is connected with the middle of a water feeding path 2, feeds air through the air supplying path into water flowing through the water feeding path and mixes the air and water, wherein, in the middle of the water feeding path, an oxygen enriching vessel 13 in which a nitrogen absorbing agent 16 for selectively adsorbing nitrogen is filled is arranged.

Probable Assignee: PANASONIC ELEC WORKS CO LTD

Earliest Publication Date: 20110609



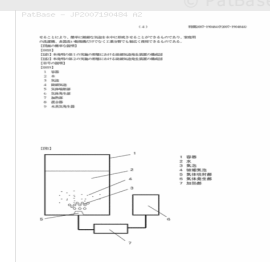
21) Family number: 36064179 (JP2007190484 A2)

DEVICE FOR GENERATING FINE AIR BUBBLE

Abstract: Source: JP2007190484 A2 PROBLEM TO BE SOLVED: To simply, efficiently and stably supply very fine air bubbles in water. SOLUTION: A device for generating fine air bubbles is provided with an air generating part 6, a heating part 7 heating the air generated in the air generating part 6 and an air jetting part 5 jetting the air heated in the heating part 7 into water, and can efficiently and stably supply the very fine air bubbles.

Probable Assignee: MATSUSHITA ELECTRIC IND CO LTD

Earliest Publication Date: 20070802



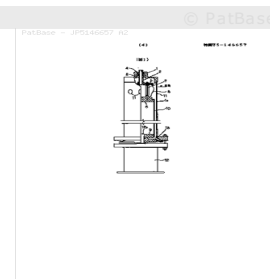
22) Family number: 10163020 (JP5146657 A2)

AIR BUBBLE GENERATING APPARATUS

Abstract: Source: JP5146657 A2 PURPOSE: To increase the dissolved oxygen amount in water within a short time by increasing the generation amount of fine air bubbles. CONSTITUTION: A bubble generating apparatus is provided with a cylindrical cylinder 1a, a cylindrical rotating rotor 10 which rotates while being installed in water in the inside of the cylinder 1a, and a stirring part installed in the upper part of the rotating rotor 10 to stir the water surface and generate bubbles and has structure wherein the bubbles generated by the stirring part are supplied to a gap between the cylinder 1a and the rotating rotor 10 to make the bubbles fine.

Probable Assignee: NICHIAI CORP

Earliest Publication Date: 19930615



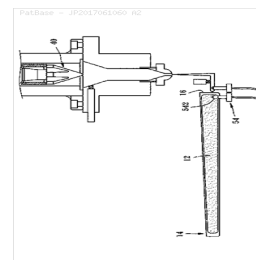
23) Family number: 65420764 (JP2017061060 A2)

PROCESSING METHOD FOR GENERATING FINE AIR BUBBLE IN POLYMER BY PROCESSING MOLDING MACHINE

Abstract: Source: JP2017061060 A2 PROBLEM TO BE SOLVED: To provide a processing method for generating fine air bubbles in a polymer by a processing molding machine. SOLUTION: In a processing method for generating fine air bubbles in a polymer by a processing molding machine, a fine air bubble generation unit is arranged at a proper position in a mold, a transport bolt, a tube or the like. The fine air bubble generation unit has a porous part getting into a fluid polymer. Consequently, gas with high pressure and high temperature can be flown to the porous part of the fine air bubble unit, fine air bubbles are generated, and the fine air bubbles and the fluid polymer can be mixed uniformly. A product good in foaming effect is completed by cooling the mixed fine air bubbles and fluid polymer. SELECTED DRAWING: Figure 1

Probable Assignee: EVERFOCUS INT CO LTD

Earliest Publication Date: 20170330



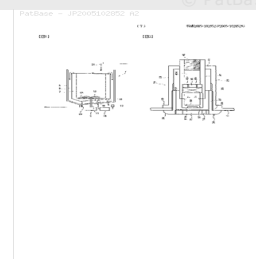
24) Family number: 31938201 (JP2005102852 A2)

WASHING APPARATUS AND AIR BUBBLE GENERATING NOZZLE USED IN THE APPARATUS

Abstract: Source: JP2005102852 A2 PROBLEM TO BE SOLVED: To provide a washing apparatus for washing laundry by fine air bubbles having a particle size of about 1 to 20 micro m. SOLUTION: The washing apparatus is provided with a washing tub 7 for putting the laundry in, an air bubble generating nozzle 19 for supplying the fine air bubbles into the washing tub 7, and a saturated solution producing apparatus 15 for supplying a saturated solution to the air bubble generating nozzle 19. The washing tub 7 is provided freely rotatably inside an outer tub 5 and the air bubble generating nozzle 19 is provided near the bottom part of the outer tub 5. Then, the saturated solution producing apparatus 15 sucks water inside the washing tub 7 and supplies the saturated solution to the air bubble generating nozzle 19.

Probable Assignee: SHIGEN KAIHATSU KK

Earliest Publication Date: 20050421



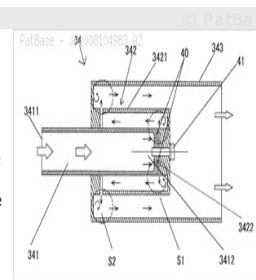
25) Family number: 41900059 (JP2008104983 A2)

ULTRA-FINE AIR BUBBLE GENERATING APPARATUS AND SYSTEM

Abstract: Source: JP2008104983 A2 PROBLEM TO BE SOLVED: To provide an ultra-fine air bubble generating system and an ultra-fine air bubble generating system which can supply a stable amount of air proportionally to a pressure from a pump. SOLUTION: The system is constituted so that the amount of air supplied to a pump mixing air and water and pressurizing the mixture can be controlled by opening a valve proportionally to the pressure of a pressurized fluid. In the ultra-fine air bubble generating apparatus, the pressurized fluid is ejected from a nozzle 40 of the end wall of a body 341 and collided with the end wall of a first decompressor 342 to form a first decompressed collision/swirling region S1 where the pressurized air ejecting into the space inside the casing of the first decompressor from the above gap and collided with the inner wall surface, and the pressurized air ejected into the space inside the casing of a second decompressor 343 from the gap between the opened end edge of the first decompressor 342 and the end wall of the second decompressor 343 and collided with the inner wall surface to form a second decompressed collision/swirling region S2.

Probable Assignee: INADA TAICHI

Earliest Publication Date: 20080508



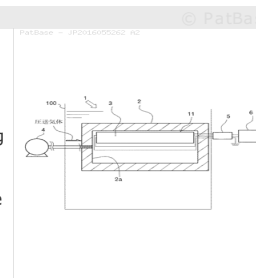
26) Family number: 62237910 (JP2016055262 A2)

GENERATOR FOR GENERATING ULTRAFINE BUBBLES CONTAINING OZONE

Abstract: Source: JP2016055262 A2 PROBLEM TO BE SOLVED: To provide a generator for generating ultrafine bubbles containing ozone, which can release the heat of a light source efficiently by a simple method. SOLUTION: An ultrafine air bubble generator 1 or a generation device for ultra-fine air bubbles containing ozone comprises: an air bubble generating medium 2 formed of a porous high-density composite or a composite of partially or wholly graphite or a nonmetal; a pump 4 (or pressure-feeding means) for feeding a gas into the air bubble generating medium 2; and a light source 3 for generating ozone by irradiating said gas with an ultraviolet ray, and the light source 3 is arranged inside of the air bubble generating medium 2. SELECTED DRAWING: Figure 2

Probable Assignee: ANZAI SATOSHI

Earliest Publication Date: 20160421



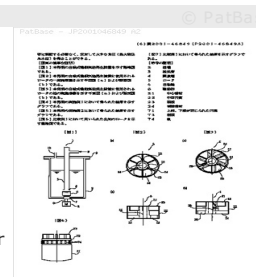
27) Family number: 14105354 (JP2001046849 A2)

SELF-PRIMING TYPE FINE AIR BUBBLE GENERATING APPARATUS

Abstract: Source: JP2001046849 A2 PROBLEM TO BE SOLVED: To provide a self-priming type fine air bubble generating apparatus unnecessary for regulating the interval between the open end of an air supply pipe and a rotor with strict accuracy and capable of stably generating constant negative pressure. SOLUTION: The self-priming type fine air bubble generating apparatus 1 is equipped with a liquid tank 2, an air supply pipe 3 introduced into the liquid in the liquid tank 2 and having a downward open end 4 and a rotor 5 arranged under the open end of the air supply pipe 3 through a predetermined gap and constituted so that air is sucked from the open end of the air supply pipe 3 by the high speed rotation of the rotor 5 to be dispersed in the liquid as fine air bubbles. The rotor 5 is equipped with a hollow cylinder 22 opened at least at its upper part, a center member 21 and a plurality of blades 23 radially arranged in the hollow cylinder and rotated centering around an erected center axial line at a high speed.

Probable Assignee: SUMITOMO SEIKA CHEMICALS

Earliest Publication Date: 20010220



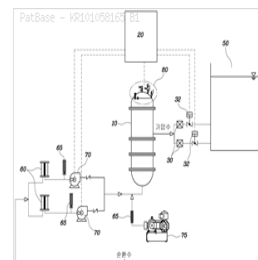
28) Family number: 50010103 (KR101058165 B1)

FINE AIR BUBBLE GENERATING AND CONTROL APPARATUS

Abstract: Source: KR101058165 B1 PURPOSE: A device for generating and controlling minute bubbles is provided to improve the maintenance and repair efficiency of a system by stably generating uniform minute bubbles with pressure control. CONSTITUTION: A strainer(60) filters large foreign particles included in circulating water. A pressure pump(70) pressurizes filtered circulating water. An air compressor(75) suctions and compresses the external air. A gas and liquid mixing tank(10) mixes the compressed air with the circulating water. Various sensors and controllers(80) control the inner air pressure by sensing the state of the gas and liquid mixing tank.

Probable Assignee: MBTECH

Earliest Publication Date: 20110822



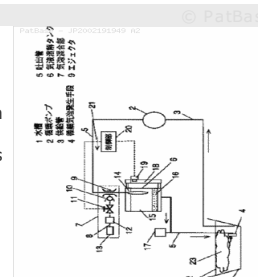
29) Family number: 23535978 (JP2002191949 A2)

FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2002191949 A2 PROBLEM TO BE SOLVED: To solve a problem that in a conventional air bubble generator, as air and hot water sucked by means of a pump are made to be finely divided and mixed by means of a high pressure jet nozzle, a high pressure and large pump is required and in addition, as a shuttle valve is used at an air suction part, it is impossible to generate stable fine air bubbles and as a two phase flow of the air and the hot water flows in the pump, life of the pump is suddenly decreased. SOLUTION: A fine air bubble generator with a constitution in which a gas-liquid dissolving tank 6 and a fine air bubble generating means 4 are provided in an outlet pipe 5 of a circulation pump 2 and a gas-liquid mixing part 7 is provided in an inlet part of the gas-liquid dissolving tank 6 and gas in the gas-liquid dissolving tank 6 and a gas-liquid mixed fluid flowing into the gas-liquid dissolving tank 6 are mixed and dissolved is provided and it is possible to provide the fine air bubble generator by which a gas can be dissolved into a fluid under a low pressure and in a short time and fine air bubbles can be stably generated and which uses a small-sized pump and has a simple constitution, stable performance and high reliability.

Probable Assignee: MATSUSHITA ELECTRIC IND CO LTD

Earliest Publication Date: 20020710



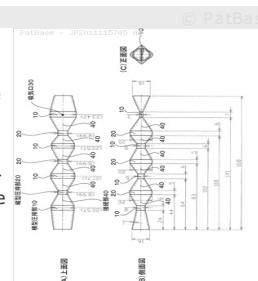
30) Family number: 49376453 (JP2011115745 A2)

AIR BUBBLE GENERATING TUBE

Abstract: Source: JP2011115745 A2 PROBLEM TO BE SOLVED: To provide an air bubble generating tube generating fine air bubbles in a simple structure. SOLUTION: The air bubble generating tube 1 includes a tube body, a first compressed part compressed in a flat shape (a horizontal compressed part 10) in a direction perpendicular to the axis of the tube body, a second compressed part (a vertical compressed part 20) compressed in a flat shape in a direction perpendicular to the axis of the tube body and different from that of the first compressed part, and a suction opening 30 installed either at the first compressed part or at the second compressed part. In the air bubble pipe 1, the first compressed part and the second compressed part are alternately formed.

Probable Assignee: NAKANISHI TOYOHICO

Earliest Publication Date: 20110616



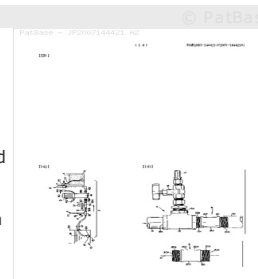
31) Family number: 34904679 (JP2007144421 A2)

AIR BUBBLE ATOMIZER

Abstract: Source: JP2007144421 A2 PROBLEM TO BE SOLVED: To provide an air bubble atomizer capable of efficiently generating a fine air bubble liquid containing a sufficiently fine air bubble, and simple and inexpensive. SOLUTION: The air bubble atomizer further atomizing the air bubble atomized by a first air bubble atomizer B comprises an external cylindrical body 70 forming a partition wall 70a boring a plurality of liquid inflow holes 70c on the upstream side in a liquid supply direction and formed with a fixed inner diameter; and a shaft body 71 having a thick diameter part 80c coaxially placed in the external cylindrical body 70 and formed on the outer diameter opposing the liquid inflow hole 70c over a predetermined range along the liquid supply direction so as to divide to form an upstream side air bubble liquid path beta having a fixed cross section over a predetermined range along the liquid supply direction in the external cylindrical body 70 and a reduced diameter part 80d gradually reducing a diameter from the thick diameter part 80c to the downstream side in the liquid supply direction so as to divide to form a downstream side air bubble liquid path ? gradually increasing the cross section from the upstream side in the liquid supply direction to the downstream side on the downstream side of the upstream side air bubble liquid path beta.

Probable Assignee: KIKUCHI ECO EARTH KK

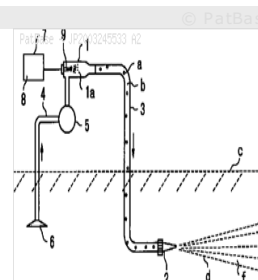
Earliest Publication Date: 20070614



32) Family number: 29155252 (JP2003245533 A2)

ULTRAFINE AIR BUBBLE GENERATOR

Abstract: Source: JP2003245533 A2 PROBLEM TO BE SOLVED: To provide an ultrafine air bubble generator capable of generating only ultrafine air bubbles which can be installed in water for a long time in a deep water area, or in a shallow water area where the air bubbles are easy to rise with a high speed and in fresh water where air bubbles are easy to become large in size, in large quantities with good energy efficiency by a simple system. SOLUTION: The ultrafine air bubble generator comprises an upstream air bubble mixing part 1 and a downstream contraction nozzle part 2, both of which are connected in a communication state. The air bubble mixing part 1 has a fine air bubble generation part 7 capable of mixing fine air bubbles (a) which are generated by injecting air in the water stream in a liquid chamber 1a from jet orifices 10, with a fluid (b) and the contraction nozzle part 2 has a fluid guide surface part 11 formed into a flow channel shape capable of increasing the speed of the fluid (b) mixed with fine air bubbles (a) to guide the same and capable of forcibly deforming the fluid (b) for collapsing fine air bubbles (a) in the fluid (b) to spread them in a planar state and more finely dividing them by surface tension to form ultrafine air bubbles.



Probable Assignee: MORI KIKAI SEISAKUSHO KK

Earliest Publication Date: 20030902

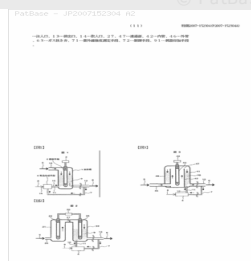
33) Family number: 34926742 (JP2007152304 A2)

METHOD AND APPARATUS FOR TREATING LIQUID

Abstract: Source: JP2007152304 A2 PROBLEM TO BE SOLVED: To provide a method for treating a liquid having high sterilization and inactivation performances, and also economical using ultraviolet light having a plurality of wavelengths and a fine air bubble together; and an apparatus for treating the liquid. SOLUTION: The method comprises the steps of installing irradiation means 2 for irradiating the inside of a reactor 1 with the ultraviolet light having at least two wavelength peaks, generating a two-phase flow 10 containing a fine air bubble of gas 8 by injecting the gas 8 into a part of treated water 6 by air bubble generation means 4, injecting the generated two-phase flow 10 from air bubble injection means 11 into the reactor 1, receiving the ultraviolet light having at least two wavelength peaks radiated by the irradiation means 2 into water to be treated 5 flowing from an injection port 12 in the top of the reactor 1 while the fine air bubble 9 is retained, and discharging it from a discharge port 13 in the bottom of the reactor 1 as the treated water 6.

Probable Assignee: HITACHI LTD

Earliest Publication Date: 20070621



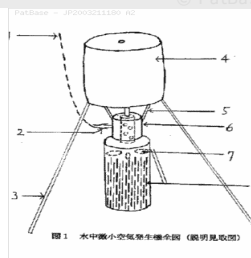
34) Family number: 28912388 (JP2003211180 A2)

UNDERWATER FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2003211180 A2 PROBLEM TO BE SOLVED: To provide an underwater fine air bubble generator generating large air discharge force by little power by developing a machine using small power to generate air bubbles corresponding to the small power by studying especially the shape of rotary blades and the angle of air blowoff orifices for the purpose of solving the defect, that various devices are performed heretofore in order to reduce the size of air bubbles in the treatment of water by air-liquid contact using aeration for blowing off a proper amount of air from the bottom of a treatment tank to clean water but the blowoff force of air bubbles does not overcome water pressure as the depth of water becomes large and large power is consumed, and directly generating air bubbles in water from air sucked from a hose. SOLUTION: Each of stirring blades is formed into a cylindrical shape to be expanded in the shearing surface thereof and air blowoff orifices are made linear to suppress water pressure from the outside to the utmost and arranged at a certain angle to obtain centrifugal force in the discharge of air.

Probable Assignee: KINOSHITA TAKASHI

Earliest Publication Date: 20030729



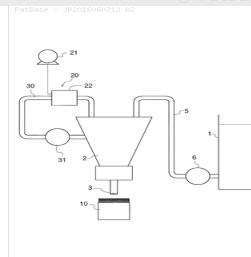
35) Family number: 62333101 (JP2016060713 A2)

METHOD FOR MANUFACTURING COSMETIC CONTAINING SUPERFINE AIR BUBBLES

Abstract: Source: JP2016060713 A2 PROBLEM TO BE SOLVED: To provide a method for manufacturing a cosmetic containing superfine air bubbles in which various types of gas as superfine air bubbles can be mixed into a cosmetic being highly viscous liquid.SOLUTION: A method for manufacturing cosmetic has: a conveyance process S30 of conveying from a storage tank 1 to a hopper 2 for dividing into a smaller amount; and an injection process S40 of injecting the liquid conveyed to the hopper 2 from an inlet 3 into a product container 10, in which the method has a superfine air bubbles generation process S35 of generating superfine air bubbles in the liquid while the liquid conveyed to the hopper 2 moves from the hopper 2 to the inlet 3. In the superfine air bubble generation process S35, a superfine air bubble generator 20 equipped with a compressor 21 and an air bubble generating medium 22 is used, the air bubble generating medium 22 is formed of a porous high-density complex a part or all of which is a complex of graphite and non-metal, and gas is pressure-fed from the compressor 21 into an internal space 22a of the air bubble generating medium 22 to generate superfine air bubbles from fine holes 22b of the air bubble generating medium 22.SELECTED DRAWING: Figure 2

Probable Assignee: ANZAI SATOSHI

Earliest Publication Date: 20160425



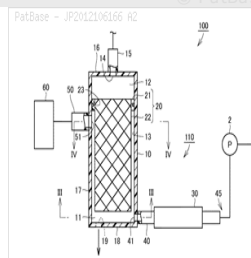
36) Family number: 51306394 (JP2012106166 A2)

GAS/LIQUID MIXING APPARATUS AND WATER PURIFIER EQUIPPED WITH THE SAME

Abstract: Source: JP2012106166 A2 PROBLEM TO BE SOLVED: To provide a gas/liquid mixing apparatus capable of effectively generating gas bubbles, and a water purifier equipped with it.SOLUTION: The gas/liquid mixing apparatus 110 includes a fine air bubble generator 32 having a negative pressure part and a housing 10. The negative-pressure part of the fine air bubble generator 32 puts water into circulation, sucks a gas by changing it to a negative-pressure state, and dissolves the sucked gas in water, thus generating microscopic air bubbles in water. The housing 10 has an inflow port 41 and an outflow port 51. The inflow port 41 causes water, having microscopic air bubbles and flowed through the fine air bubble generator 32, to flow into the housing 10. The outflow port 51 causes water, flowing from the inflow port 41 and having fine air bubbles, to outflow from the housing 10. The aperture of the outflow port 51 is larger than the aperture of the inflow port 41.

Probable Assignee: SHARP KK

Earliest Publication Date: 20120607



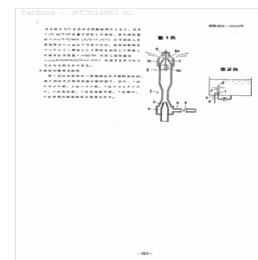
37) Family number: 5431586 (JP53016963 A2)

AIR BUBBLE GENERATING DEVICE

Abstract: Source: JP53016963 A2 PURPOSE:To provide an air bubble generating device, which can generate fine air bubbles efficiently by leading liquid into a nozzle provided with a cavity resonance type fluid dispersing device after air bubbles are sucked by letting liquid flow into an ejector.

Probable Assignee: KURITA INDUSTRIAL CO LTD

Earliest Publication Date: 19780216



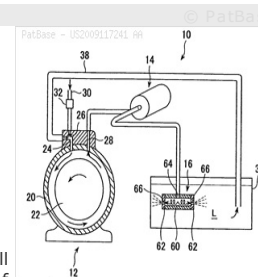
38) Family number: 40846391 (US2009117241 AA)

FINE BUBBLE GENERATING APPARATUS

Abstract: Source: US2009117241 AA This invention provides a fine bubble generating apparatus which can efficiently generate fine bubbles on the nanometer level. This apparatus comprises a cylindrical member (40) having a cylindrical inner peripheral surface, a first end wall member (42) configured to close one end of the cylindrical member, and a second end wall member (44) configured to close the other end of the cylindrical member. The cylindrical member (40) and the first and second end wall members (42) and (44) define a fluid swirling chamber (46). The cylindrical member has a fluid inlet hole (48) at a position close to the second end wall member (44) to supply a gas-liquid mixed fluid in the tangential direction of the peripheral surface of the fluid swirling chamber (46). The second end wall member has a fluid outlet hole (50) extending therethrough along the center axis of the inner peripheral surface of the fluid swirling chamber. The gas-liquid mixed fluid is introduced into the fluid swirling chamber at a position close to the second end wall member. Most of the fluid is directed toward the first end wall member while swirling along the inner peripheral surface of the fluid swirling chamber, reversed from the first end wall member toward the second end wall member and discharged through the fluid outlet hole.

Probable Assignee: LIGARIC CO LTD

Earliest Publication Date: 20071129



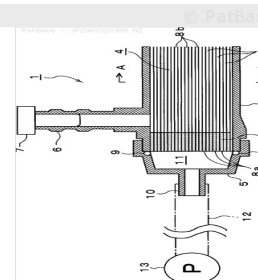
39) Family number: 29813293 (JP2003320389 A2)

AIR BUBBLE GENERATION MODULE AND AIR BUBBLE GENERATOR

Abstract: Source: JP2003320389 A2 PROBLEM TO BE SOLVED: To provide an air bubble generation module capable of efficiently generating fine air bubbles and hard to generate clogging. SOLUTION: The air bubble generation module is constituted of a cylindrical casing, a hollow fiber bundle 4, which is mounted in the casing and characterized in that the gaps between hollow fibers and the gaps between the hollow fibers 8 and the inner surface of the casing are filled with a resin composition and both ends of the hollow fibers are open, a lid material 5 having an air inlet 10 and covering one end opening part of the casing and an air feed chamber 11 formed between the lid material and the end surface of the hollow fiber bundle and communicating with the base end openings 8a of the hollow fibers.

Probable Assignee: NIKKISO CO LTD

Earliest Publication Date: 20031111



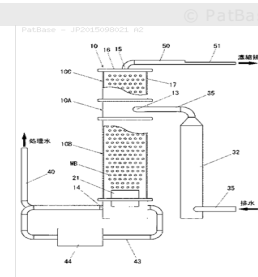
40) Family number: 59495123 (JP2015098021 A2)

WASTEWATER TREATMENT APPARATUS

Abstract: Source: JP2015098021 A2 PROBLEM TO BE SOLVED: To provide a wastewater treatment apparatus that can more efficiently separate and treat the dirt content of wastewater with simple configuration. SOLUTION: The wastewater treatment apparatus includes: a separation and treatment tank 10 having a required length in the vertical direction so as to separate and treat the dirt content of wastewater by forming flocks; an air bubble generating part 21 which is a constituent of a fine air bubble generating device and is arranged inside the separation and treatment tank 10 so as to generate fine air bubbles; a raw water inlet port 13 to which a wastewater raw water is fed and which is provided in the separation and treatment tank 10 and at a position upper than a position where the air bubble generating part 21 is arranged; a treated water outlet port 14 through which treated water obtained by clarifying the wastewater is discharged and which is provided in the separation and treatment tank 10 and at a position lower than a position where the air bubble generating part 21 is arranged; and a dirt-concentrated water discharge port 15 through which dirt-concentrated water is discharged accompanied by flocks and which is provided in the top end of separation and treatment tank 10, the dirt-concentrated water being water in which a dirt content is concentrated.

Probable Assignee: TAKEMURA SEISAKUSHO KK

Earliest Publication Date: 20150528

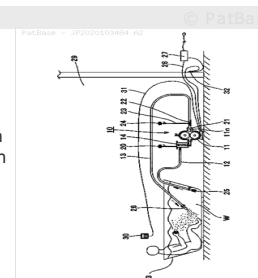


41) Family number: 79904522 (JP2020103484 A2)

AIR-BUBBLE GENERATING DEVICE FOR BATHTUB

Abstract: Source: JP2020103484 A2 To provide an air-bubble generating device 10 for a bathtub in which air bubbles generated in bathtub water W are miniaturized, and thereby superior massage effect and fatigue recovery effect can be obtained. SOLUTION: Air bubbles in bathtub water W generated by mixing air with a gas-liquid mixer 14 are made to hit a collision block piece 21 to form fine air bubbles. Further, the fine air bubbles are made to hit a step surface 11s formed in an outlet 11n of a gear pump 11 to perform miniaturization furthermore. In addition to air being mixed from the gas-liquid mixer 14, the air is further mixed with the bathtub water W through an air supply tube along with pressure drop of the bathtub water W generated by an ejector 22. The gear pump 11 is used in the pump, and the air bubbles are miniaturized by gear rotors 11b, 11c of the gear pump 11. SELECTED DRAWING: Figure 1

Probable Assignee: ANLET KK



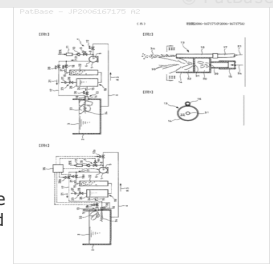
42) Family number: 33161974 (JP2006167175 A2)

AIR BUBBLE GENERATOR

Abstract: Source: JP2006167175 A2 PROBLEM TO BE SOLVED: To effectively generate fine air bubbles and large air bubbles inside a water tub by simple device constitution and a control means. SOLUTION: An air bubble generator comprises: an air bubble jetting device 13 composed of a microbubble nozzle 14 and a big air bubble nozzle 16 to be arranged in the water tub 2; a pump 1 for sucking, pressurizing and circulating the water 3 of the water tub 2; an air mixing device 7 provided in the intake part 5 of the pump 1; a first flow path 15 provided with an air dissolved water generator 19 for dissolving air in pressurized water 21 mixed with the air discharged from the pump 1, separating and removing undissolved air and generating air dissolved water 24, for supplying the generated air dissolved water 24 to the fine air bubble nozzle 14; and a second flow path 17 for supplying the pressurized water 21 mixed with the air discharged from the pump 1 through a switching valve 28 to the big air bubble nozzle 16.

Probable Assignee: PHYSIC JAPAN KK

Earliest Publication Date: 20060629



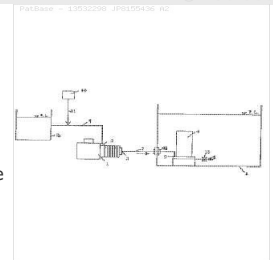
43) Family number: 13532298 (JP8155436 A2)

FINE AIR BUBBLE GENERATOR

Abstract: Source: JP8155436 A2 PURPOSE: To generate ideal fine air bubbles by a simple and small-sized device by providing two pumps different in emitting pressure and having rotary blades and generating fine air bubbles by utilizing the pressure difference at the time of operation between both pumps. CONSTITUTION: The emitting orifice 3 of a multistage vortex pump (high emitting pressure pump) 1 is connected to the piping 7 piercing the side wall of a water tank 8 and an underwater vortex pump (low emitting pressure pump) 4 equipped with a suction port 6 provided with a flow rate regulating valve 12 and a nozzle and an emitting port 5 is arranged in the water tank 14. The suction port of the multistage vortex pump 1 is connected to a separate water tank 14 by water supply piping 9 and the emitting port of a small-sized air pump 10 is connected to the midway of the water supply piping 9 by air supply piping 11. When both pumps 1, 4 are started, air mixed water is sucked into the pump 1 and air bubbles are pressurized in a state destructed by rotary blades within the pump 1 to be sent to the pump 4 and again dispersed by the rotary blades of the pump 4 and emitted to generate fine air bubbles.

Probable Assignee: ICHIKAWA WOOLEN TEXTILE

Earliest Publication Date: 19960618



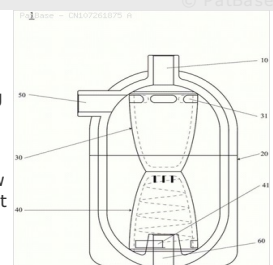
44) Family number: 67260086 (CN107261875 A)

FINE AND ULTRAFINE AIR BUBBLE GENERATING MODULE AND APPLICATION DEVICE THEREOF

Abstract: Source: CN107261875 A The invention relates to a fine and ultrafine air bubble generating module and an application device thereof. The fine and ultrafine air bubble generating module is composed of an upper gas-liquid mixing cavity body part, a module cavity body and a lower fine bubble generating cavity body part. The upper gas-liquid mixing cavity body part is a conical body, has a large diameter in the upper part and a small diameter in the lower part and is provided with an outlet overflow hole in the upper part. The lower fine bubble generating cavity body part is a conical body, has a small diameter in the upper part and a large diameter in the lower part and is provided with an inlet overflow hole in the lower part. The upper gas-liquid mixing cavity body part and the lower fine bubble generating cavity body part are arranged in the module cavity body. The module cavity body is provided with an inlet, and outlet and a pressure relief opening. The upper gas-liquid mixing cavity body part is mainly used for mixing gas and a liquid. The lower fine bubble generating cavity body part is mainly used for producing fine and ultrafine air bubbles. The module cavity body can guide a liquid flowing out of the outlet overflow hole to the inlet overflow hole and increase gas-liquid mixing time.

Probable Assignee: GAIA BIOSCIENCE LTD

Earliest Publication Date: 20171020



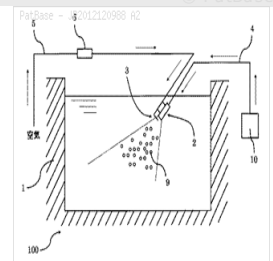
45) Family number: 51563038 (JP2012120988 A2)

FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2012120988 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generator with a more simple structure capable of efficiently generating air fine bubbles in a liquid by introducing gas into the liquid without installing a gas feeding apparatus such as a compressor and a compression cylinder. SOLUTION: The air fine bubble generator includes a liquid storage part 1 for storing the liquid, a liquid-jet nozzle 2 arranged in the liquid of the liquid outlet part and having a liquid outlet part 2a, a gas-suction nozzle 3 arranged on an outer edge of the liquid outlet part and having a gas outlet part, and a flow rate controller 6 for controlling the flow rate of the gas flowing out from the gas outlet part 3a. The air fine bubble generator is characterized in that the gas outlet part is arranged in a flow passage of the liquid jetted from the liquid outlet part, a negative pressure generation part is generated on a downstream edge part of the gas outlet part, and the gas is automatically sucked into the liquid.

Probable Assignee: CENTRAL GLASS CO LTD

Earliest Publication Date: 20120628



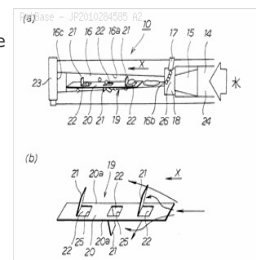
46) Family number: 48157130 (JP2010284585 A2)

FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2010284585 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generator attached to liquid supply piping to be used and capable of generating fine air bubbles in high density by simple constitution. SOLUTION: The fine air bubble generator 10 attached to the leading end part of the liquid supply piping 12 to be used is configured to include a throttle part 15 for contracting the diameter of the flow channel 14 from the liquid supply piping 12, a diffuser part 16 arranged downstream of the throttle part 15 and constituted so that the inner diameter of the inner wall surface 16a thereof is expanded toward downstream of the throttle part 15 and an air chamber part 18 for supplying air to the interval part 26 between the throttle part 15 and the diffuser part 16. A barrier plate continuously provided plate 19, wherein a plurality of barrier plates 21 and flow openings 22 are continuously provided in a discharge direction X, is provided to the cross-sectional central part of the diffuser part 16 in a state that intervals S1, S2 and S3 are held between the barrier plates 21 and the inner wall surface 16a of the diffuser part 16.

Probable Assignee: KAO CORP

Earliest Publication Date: 20101224



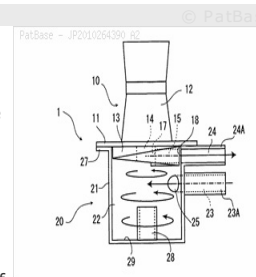
47) Family number: 47927402 (JP2010264390 A2)

FINE AIR BUBBLE GENERATOR

Abstract: Source: JP2010264390 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generator capable of more effectively generating air bubbles of a micro size or a nano size in a liquid that passes on. SOLUTION: The fine air bubble generator 1 configured by a case 21 having a bottom that comparts a cylindrical reforming spacing 22, a vibrating plate 11 provided so as to block an opening side of the case 21, and an ultrasonic vibrator unit 12 provided on the vibrating plate to vibrate the vibrating plate, wherein a liquid inflow section is formed along the tangential direction of a cylindrical wall surface of the case 21 that comparts the reforming spacing 22 and a liquid outflow section is opened at almost the center on the vibrating plate side of the reforming spacing 22, and, the above liquid outflow section is configured by a vibrating plate side communication hole 15 having a fluid outlet hole 24 that penetrates a liquid outflow pipe 24A formed in the case 21, a central opening section 17 that is opened at almost the center of the vibrating plate 11, a peripheral opening section 18 that is opened at a position opposed to an outflow opening section 26 on the reforming spacing side of the liquid outflow pipe 24A, is provided.

Probable Assignee: ARTE ELECTRONICS CO LTD

Earliest Publication Date: 20101125



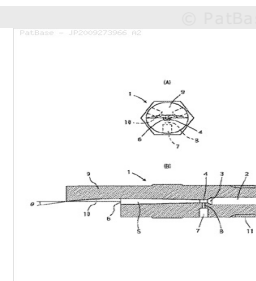
48) Family number: 44156693 (JP2009273966 A2)

FINE AIR BUBBLE GENERATING NOZZLE AND DEVICE PROVIDED WITH THE SAME

Abstract: Source: JP2009273966 A2 PROBLEM TO BE SOLVED: To provide a nozzle which has a simple constitution and can produce a water flow containing fine air bubbles in a wide angular range without deteriorating the current speed or the colliding force, and a device provided with the same. SOLUTION: The air bubble generating nozzle comprises a liquid channel forming a venturi tube (including a minimum channel part 4 in which the channel width is squeezed from the upstream of the nozzle body 1 toward a squirt hole 6 of the end, and an expanded channel part 5 in which the channel width expands downstream of the minimum channel part), gas flow paths 7, 8 combining with the minimum channel part, and a guide wall 9 extending in a front direction of the nozzle body 1, curving parabolically toward the central axis of the squirt hole, and guiding a fluid from the squirt hole at a wide angle. The guide surface 10 of the guide wall is curved in a U shape in cross section in a width direction.

Probable Assignee: NOMURA MICRO SCIENCE KK

Earliest Publication Date: 20091126



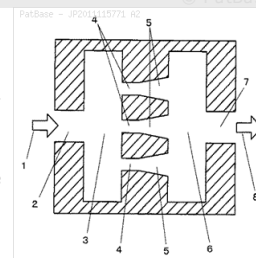
49) Family number: 49372033 (JP2011115771 A2)

FINE AIR BUBBLE GENERATOR FOR MICROBUBBLE SHOWER

Abstract: Source: JP2011115771 A2 PROBLEM TO BE SOLVED: To provide a fine air bubble generator capable of generating a large quantity of fine air bubbles with few variations in grain size. SOLUTION: The fine air bubble generator, as shown in Fig. 1, is structured so that a plurality of Venturi tubes 3 are mounted on a front chamber 2 with a volume suitable to suppress a flowing velocity of water, each of the Venturi tubes is mounted with a diffuser 4 on outlet side, and the diffuser meets to have a volume suitable to suppress a flowing velocity of water and then meets at a chamber 5. Gathering water flows out from an outlet 6. In this structure, to increase the inner velocity of the Venturi tube against the required amount of water to pass, a plurality of Venturi tubes with fine tube diameters are important to install. By increasing the inner velocity of the Venturi tube, high vacuum occurs and supersaturated air is separated from water to generate fine air bubbles.

Probable Assignee: URATANI MASAO

Earliest Publication Date: 20110616



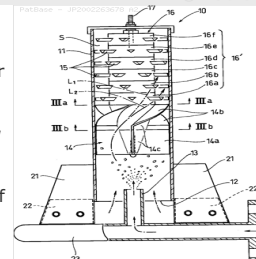
50) Family number: 23995590 (JP2002263678 A2)

DEVICE FOR PRODUCING WATER WHICH CONTAINS FINE AIR BUBBLE

Abstract: Source: JP2002263678 A2 PROBLEM TO BE SOLVED: To obtain a device for producing bubble-containing water which can make air bubbles more minute by employing a means for breaking the air bubbles more finely and mix the fine air bubbles uniformly with the flow when generating a flow which contains fine air bubbles for purification of a sludge tank or the like. SOLUTION: The device for producing bubble-containing water is equipped, at the lower end of the hollow cylinder 11, with an air blow-off pipe 13, a guide vane 14 which guides a water stream to the inside and makes it into a helical ascending flow, and a bubble breaking means 16 for making the air bubbles contained in the stream finer. The bubble breaking means 16 is constituted by providing a large number of protrusions 15 on the outer peripheral surface of a cylindrical body 16' which has a diameter smaller than that of the hollow cylinder 11. A helical water flow is generated in the annular space S between the bubble breaking means 16 and the hollow cylinder 11, the fine air bubbles are mixed to the flow, and the resultant water flow is discharged upwards.

Probable Assignee: AZ SHOJI KK

Earliest Publication Date: 20020912



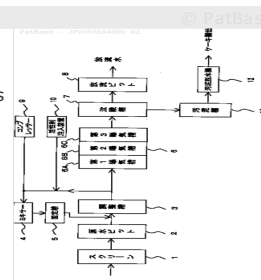
51) Family number: 28710338 (JP2003164890 A2)

WASTE WATER TREATMENT SYSTEM AND MIXING EQUIPMENT

Abstract: Source: JP2003164890 A2 PROBLEM TO BE SOLVED: To provide a new waste water treatment system which is extremely high in treatment efficiency and is cost effective. SOLUTION: The waste water treatment system for treating waste water has fine air bubble generating means for generating microbubbles, microbial cell fixing means fixed with microbial cells and pressurizing means for pressurizing the microbubbles generated by the fine air bubble generating means to the waste water containing the microbial cells obtained from the microbial cell fixing means. The microbubbles, are made to remain in the waste water for a long time by the turbulence arising in reducing the pressure and the oversaturated dissolved oxygen state is maintained and biological oxidation is progressed during this time, by which aerobic bacteria are admitted into the waste water and therefore the microorganisms can be surely destroyed and the efficient volume reduction of excess sludge is made possible.

Probable Assignee: FM ECOLOGY KENKYUSHO KK

Earliest Publication Date: 20030610



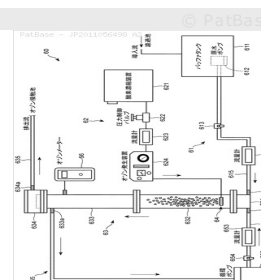
52) Family number: 48714687 (JP2011056498 A2)

APPARATUS AND SYSTEM FOR GENERATING HIGH-CONCENTRATION DISSOLVED WATER

Abstract: Source: JP2011056498 A2 PROBLEM TO BE SOLVED: To provide an apparatus for generating high-concentration dissolved water capable of obtaining the high-concentration dissolved water by securing sufficient contact for dissolving gas in raw water and also suppressing enlargement of the apparatus, and a system for generating the high-concentration dissolved water. SOLUTION: The apparatus for generating the high-concentration dissolved water 60 includes: a cylindrical gas-liquid contact tank 63 from which dissolved water generated by bringing fine air bubbles into contact with the raw water introduced from an inlet 631a is removed from an outlet 634a; an air bubble generator 64 for generating the fine air bubbles into the gas-liquid contact tank 63; a dissolved water pipe 651 to be a circulation passage one end of which is connected to the top of the gas-liquid contact tank 63, another end of which is connected to the bottom and to which the dissolved water in the gas-liquid contact tank 63 flows; and a circulating pump 652 provided on the dissolved water pipe 651 and circulating the dissolved water in the gas-liquid contact tank. The raw water brought into contact with the fine air bubbles from the air bubble generator 64 in the gas-liquid contact tank 63 is made into the high-concentration dissolved water by orbiting around the dissolved water pipe 651 with the circulating pump 652 to repeat circulation.

Probable Assignee: KYUSHU INST TECHNOLOGY

Earliest Publication Date: 20110324



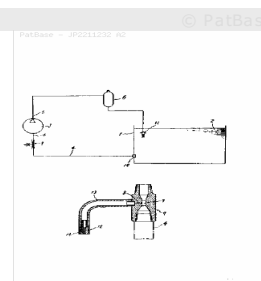
53) Family number: 4899065 (JP2211232 A2)

GAS ASPIRATOR FOR FINE AIR BUBBLE GENERATING APPARATUS AND PUMP EQUIPPED WITH SAID ASPIRATOR

Abstract: Source: JP2211232 A2 PURPOSE: To reduce installation cost by providing a gas sucking fine port, which is markedly finer than the passage of a throttled part, to said passage by drilling. CONSTITUTION: The passage 7 of a throttled part formed so as to have a diameter about 1/2-2/3 that of a pipeline 4 on a suction side so that the flow velocity of a fluid becomes suddenly faster than that in the pipeline part on the suction side is provided to the pipeline 4 on the suction side communicating with the suction part of a pump 3. Then, to the passage 7 of the throttled part, a gas sucking apparatus 9 provided with a gas sucking fine port 8 markedly finer than said passage 7 by about 1/20-1/10 is provided. Further, one end part of a hose 13 is connected to the opening end part on the suction side of the gas sucking fine port 8 and a plug body 12 having a fine gas sucking port 14 is mounted to said hose 13. By this method, the rotation of the pump can be stabilized.

Probable Assignee: FAMILY KK

Earliest Publication Date: 19900822



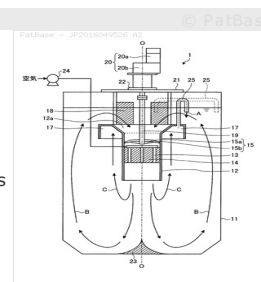
54) Family number: 62172094 (JP2016049526 A2)

POWER SAVING TYPE AERATION AGITATOR

Abstract: Source: JP2016049526 A2 PROBLEM TO BE SOLVED: To reduce a power amount required for generating an air downflow and water flow in a water tank. SOLUTION: An aeration agitator 1 comprises: a water tank 11; a fine air bubble diffuser 13 disposed in a casing formed of a draft tube 12 and a cone-shaped part 12a, and for emitting fine air bubbles; and an agitation blade 15 disposed on the fine air bubble diffuser 13 and rotating around a shaft. The fine air bubble diffuser 13 is formed of plural columnar diffusion cylinders 13-1 to 13-n, in which the respective diffusion cylinders 13-1 to 13-n are arranged intermittently in a row state along periphery of a circle which is concentric to a circle having radius of length dimension of equal to or more than 50 percent and equal to or less than 90 percent to radius Rof a circle drawn with an outer end of the agitation blade 15, and so that length directions of the diffusion cylinders become a vertical direction. On a lower side of the agitation blade 15, a stationary blade 14 formed of plural planar plates installed so that plane directions of them become substantially parallel to the length directions of the respective diffusion cylinders 13-1 to 13-n, is provided. SELECTED DRAWING: Figure 1

Probable Assignee: METAWATER CO LTD

Earliest Publication Date: 20160411



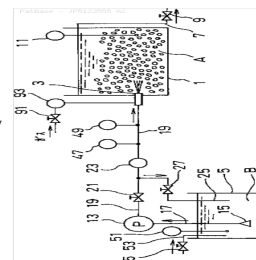
55) Family number: 10094847 (JP5123555 A2)

METHOD FOR GENERATING FINE AIR BUBBLES AND APPARATUS THEREFOR

Abstract: Source: JP5123555 A2 PURPOSE:To simply and variably set the mean diameter of formed air bubbles and the diameter range thereof corresponding to various demands. CONSTITUTION:A liquid nozzle and an ejector type gas nozzle 3 having a gas nozzle are used and a liquid B is injected in a liquid A to be aerated from the liquid nozzle and air is sucked in the liquid A to be aerated from the gas nozzle of the ejector type gas nozzle 3 by the negative pressure due to the jet stream of the liquid to generate fine air bubbles in the liquid A to be aerated. In this fine air bubble generating method, the flow rate and pressure of the liquid B supplied from the liquid nozzle are individually controlled quantitatively and variably and, by this control, the jet speed of the liquid B injected in the liquid A to be aerated from the liquid nozzle is variably set.

Probable Assignee: IDEC IZUMI CORP

Earliest Publication Date: 19930521



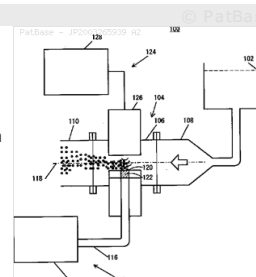
56) Family number: 29301004 (JP2003265939 A2)

APPARATUS AND METHOD FOR GENERATING AIR BUBBLE, AND APPARATUS AND METHOD FOR PRODUCING FINE PARTICLE

Abstract: Source: JP2003265939 A2 PROBLEM TO BE SOLVED: To provide an apparatus and a method for generating a large quantity of minute air bubbles. SOLUTION: In the method for generating air bubbles in the liquid, an outlet part of a gas flow passage 116 having a porous member 122 in the outlet part is arranged in a liquid. A vibration source 124 is arranged so that the vibration is imparted to the surface of the member 122 on the liquid side. The source 124 is arranged particularly at the position facing the surface of the member 122 so that the source 124 can impart the vibration to the surface of the member 122 through the liquid. Then, a gas is supplied to the passage 116. Thereby, the gas is supplied to the liquid through the member 122 and the vibration is imparted from the source 124 to the member 122 synchronizing with the supply of the gas.

Probable Assignee: TAKEDA YASUSHI

Earliest Publication Date: 20030924



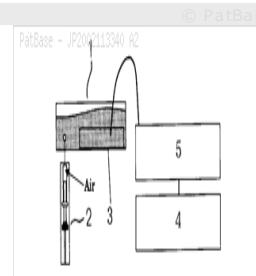
57) Family number: 23331475 (JP2002113340 A2)

METHOD AND DEVICE FOR GENERATING MICRO AIR BUBBLE USING ULTRASONIC WAVE

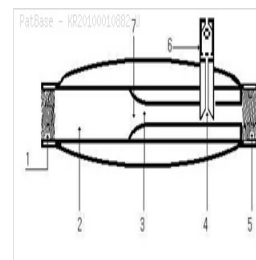
Abstract: Source: JP2002113340 A2 PROBLEM TO BE SOLVED: To efficiently and stably generate micro air bubbles having a relatively uniform dimension by utilizing unstable state at gas-liquid interface. SOLUTION: The method of continuously generating micro air bubbles from the gas-liquid interface comprises adding ultrasonic wave to the gas-liquid interface of gas and liquid before the gas forms complete air bubbles, which gas is supplied into the liquid from a gas feeding port of a fine pipe, which feeding port is provided in the liquid.

Probable Assignee: MAKUTA HISANORI

Earliest Publication Date: 20020416



Abstract: Source: KR20100010882 U The present design is routinely used in our lives (hereinafter collectively referred to as a fluid to the fluid of tap water or the like), negative (-) by incorporating air to force the dissolved oxygen ions can function to create rich fine bubbles bubbles. In order to achieve this purpose to control the flow rate and flow velocity of the fluid and air mixed into the micro-bubble generating inverter can be devised. When the design of the micro-bubble generating inverter, utilizing the force of fluid itself as the default. For this purpose, fluid dynamics application of continuous's law and Bernoulli by controlling the flow rate of the fluid and pressure difference to induce movement of air induced, structure, it means for controlling the flow rate, the flow rate is controlled by means of the air mixed into the fluid, air-entraining air suction nozzle when in contact with the fluid, air intake nozzle of the end portion of the structure, such as the mounting direction having a characteristic structure of effective micro-bubble generating devised an inverter. Fluid passing through the micro-bubble generating inverter designed is negative (-) ions and bubbles (air, dissolved oxygen) is feature rich. The properties of the positive ions can function generally say contaminants (contamination ion having the properties of the positive (+) and negative (-) (102) interacts with the ions will have a property to bond) and quickly coupled to the combination of the micro-bubble combined contamination by the contamination and separated from the load faster. As a result, the micro-bubble generating pass can be passing through the inverter (shampoo, rinse, soap represented detergents etc.) It has the effect of reducing the use of. In addition, reducing the stimulus applied to the skin is the skin or scalp, hair, and helps to effectively manage. In addition to such an action pass can be entrained air (fluid by an amount of dissolved oxygen, etc.) has also the function to save. The air and the air inlet nozzle incorporating pass can be passed through the pores for a comparison of the number of general pass can be passed through the air inlet nozzle can significantly compared to normal light feeling. And the amount of 15 to 25 percent of the fluid pressure decreases in accordance with the settings will take effect. Thus saving fluid passing through the micro-bubble generating inverter is negative (-) ions to increase an action and a primary effect is increased. And the use of such general detergents to reduce the environmental pollution to expect the effect of preventing the secondary pollution. The present design is to actively cope with environmental pollution and energy saving energy saving water treatment device to ensure that the green environment



Probable Assignee: BAKINGUK

Earliest Publication Date: 201011105

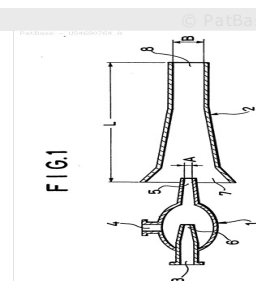
61) Family number: 13171450 (US4690764 A)

AERATOR AND AEROBIC BIOLOGICAL TREATMENT PROCESS USING SAME

Abstract: Source: US4690764 A This invention provides an aerator comprising a jet stream generator for ejecting a gas and a liquid in a mixed state from a nozzle, and a tubular flow straightener for mixing the bubble-containing stream ejected from the nozzle with ambient water and discharging the resulting mixture from the discharge orifice thereof, characterized in that the flow straightener has a tubular form whose internal diameter is reduced from the inlet toward the discharge orifice through at least a part of its length. This aerator can produce a stream containing minute gas bubbles, even when a gas is supplied thereto in such a large amount as to give a gas-to-liquid volume ratio of 3/1.

Probable Assignee: MITSUBISHI RAYON ENG

Earliest Publication Date: 19870415



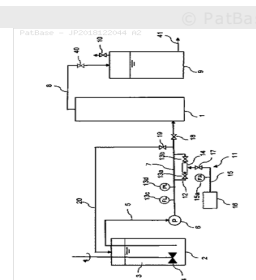
62) Family number: 70857293 (JP2018122044 A2)

AIR BUBBLE STIRRING TYPE ULTRAVIOLET IRRADIATION METHOD AND DEVICE

Abstract: Source: JP2018122044 A2 PROBLEM TO BE SOLVED: To provide ultraviolet irradiation method and device capable of irradiating ultraviolet irradiation amount needed with corresponding to ultraviolet permeability of a stock solution. SOLUTION: In an ultraviolet irradiation method for flowing a stock solution 3 which is a target for ultraviolet irradiation through a spiral tube 22 having ultraviolet permeability and irradiating ultraviolet to the stock solution from an outside of spiral of the spiral tube 22, a gas is blown to the stock solution 3. The gas is at least one of gas selected from air, oxygen gas including ozone, carbonic acid gas, inert gas or specific gas suitable for generating, decomposing or chemically changing a target material by an optical chemical reaction on a specific material in the stock solution. Further it is preferable that a fine photocatalyst is added to the stock solution in the case that the optical chemical reaction is utilized. SELECTED DRAWING: Figure 1

Probable Assignee: CHIYODA KOHAN CO LTD

Earliest Publication Date: 20180809



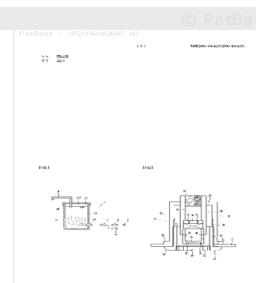
63) Family number: 32181783 (JP2006043642 A2)

ION WATER GENERATOR AND BUBBLE GENERATING NOZZLE USED FOR THE SAME

Abstract: Source: JP2006043642 A2 PROBLEM TO BE SOLVED: To provide a method for generating alkaline ion water without requiring electrolysis and an apparatus. SOLUTION: An ion water generator generates a micro bubble having an air bubble of 50 micro m or smaller in water to generate ion water. Then, the apparatus includes an impurity removal means 5 connected to a water source 3 to remove an impurity in water, a dissolved water production means 7 for producing dissolved water dissolving air in water supplied from the impurity removal means 5, a vessel 11 provided with a water pouring nozzle 9 and a bubble generating nozzle 13 for generating the micro bubble in the vessel 11 from the dissolved water supplied from the dissolved water production means 7, and has a space part 17 the upside on the vessel 11. The bubble generating nozzle 13 includes an orifice 45, a pressure relieving chamber 49 having a fine mesh net member 47, a flow direction bending part for bending a direction of water flow, and a convection chamber 29 for convecting water passing through the flow direction bending part and also relieving pressure.

Probable Assignee: SHIGEN KAIHATSU KK

Earliest Publication Date: 20050720



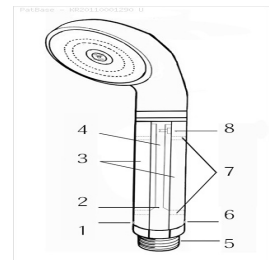
64) Family number: 48288171 (KR20110001290 U)

MULTI FUNCTION MICRO AIR BUBBLE WATER SAVING SHOWER HEAD

Abstract: Source: KR20110001290 U This devise is routinely used in (hereinafter collectively referred to as the water in the fluid, such as air is forced to entrain fluid) negative (-) ions and dissolved oxygen-rich by adding functionality to create fine bubbles bubbles or fragrance, phytoncide can be incorporated into the fluid to a multi-function shower head, the purpose of the fine bubbles bubbles. In order to achieve this purpose to control the flow rate and flow velocity of the fluid can be incorporated in the air with a built-in functionality of the micro-bubble generating structure (hereinafter collectively referred to as the bubble water-saving shower head devised a showerhead). When the design of the showerhead 115 to utilize the fluid itself was built into force. For this purpose, fluid dynamics application of continuous's law and Bernoulli by controlling the flow rate of the fluid, and the incorporation of air pressure difference induced induced, structure, it means for controlling the flow rate, the flow rate is controlled by means of the air mixed into the fluid, air-entraining air suction nozzle when in contact with the fluid, air suction nozzle end portion of the mounting structure is to direction, air inlet passage of the effective or the like provided separately to a showerhead having a characteristic structure It was devised. Fluid passing through designed showerhead (air bubble and the negative (-) ions, dissolved oxygen) is feature rich. The properties of the positive ions can function generally say contaminants (contamination, the nature of the positive ions, and negative ions interact with it will have a property to bond quickly and combines with combination of contamination by the rupture of the micro-bubble is further separated from the contaminants. In fact can pass through the micro-bubble generating showerhead chemical Detergents (shampoo, rinse, soap, which acts to reduce the use of, etc.). In addition, reducing the stimulus applied to the skin is the skin or scalp, hair or the like is helpful to effectively manage the multimedia contents. In addition to such an action can pass, etc.) entrained air (fluid by an amount of dissolved oxygen (15 to 30 percent, depending on the degree of saving the hydraulic fluid is a water-saving function to save). Indeed, may pass through the air and the air inlet nozzle incorporating while passing through holes for a comparison of the normal air inlet nozzle passing through can pass can be as much as the amount of air is entrained can significantly compared to normal soft and lightweight. Additionally, the functional ceramic and phytoncide or fragrance and the like is rich in fluid by incorporation in bubbles can be utilized for skin care or treatment, it is possible to make a number of functions. Designed showerhead by the amount of air to be mixed with the ability to save fluid passing through the fluid passed to increase the negative ions Kane microbubbles, increasing the cleaning power used in the treatment of skin protection or basic it will have an effect. And the use of such chemicals (secondary reducing the environmental pollution, it can be expected the effect of preventing environmental pollution. The present design is to actively cope with environmental pollution and energy saving energy saving water treatment apparatus a green environment.

Probable Assignee: BAKINGUK

Earliest Publication Date: 20110209



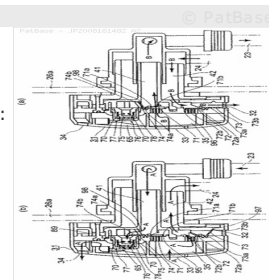
65) Family number: 42132693 (JP2008161482 A2)

BATH SYSTEM

Abstract: Source: JP2008161482 A2 PROBLEM TO BE SOLVED: To provide a circulation connecting tool which enables a bath system to perform the subsequent heating of bathtub warm water and the production of fine air bubbles. SOLUTION: When the subsequent heating is performed, a first check valve body 71 is opened, thereby introducing the warm water sucked from the warm water suction port 33 of a case 31 to a return pipe 34 through a return pipe communication passage 41 and allowing the warm water, to return to an approach pipe 24 through a circulation route, to pass an approach pipe communication passage 42, and a third check valve body 73 is opened, thereby discharging the warm water from the warm water discharge port 32 of the case 31. When the fine air bubbles are generated, a second check valve body 72 is opened, thereby introducing the warm water sucked from the warm water suction port 33 to the approach pipe 24 through the approach pipe communication passage 42 and allowing the warm water, to be supplied from the return pipe 23 to the bathtub 26 through the circulation route in an overpressure molten air state, to pass the return pipe communication passage 41, and a fourth check valve body 74 is opened, thereby introducing the warm water to a warm water discharge nozzle 75, generating the clouded fine air bubbles from the warm water to be discharged from the warm water discharge nozzle 75, and discharging the fine air bubbles from the fine air bubble discharge port 34 of the case 31.

Probable Assignee: GASTAR CORP

Earliest Publication Date: 20080717



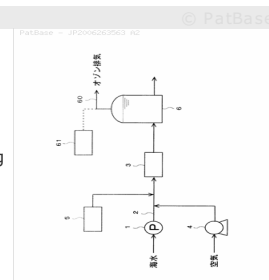
66) Family number: 33706300 (JP2006263563 A2)

APPARATUS FOR STERILIZING MICROBE OR THE LIKE IN BALLAST WATER

Abstract: Source: JP2006263563 A2 PROBLEM TO BE SOLVED: To provide an apparatus for sterilizing a microbe or the like in ballast water without increasing treatment cost and securely allowing the microbe and bacteria to be sterilized. SOLUTION: The apparatus for sterilizing the microbe or the like in the ballast water comprises a pump 1 for pressure-feeding the ballast water including seawater or fresh water having the microbe or the like, air supply means for supplying air to the ballast water to be pressure-fed from the pump 1, ozone supply means 5 for supplying ozone to the ballast water, and also a micro bubble generator 3 for generating a fine air bubble by supplying the ballast water mixed with air and ozone.

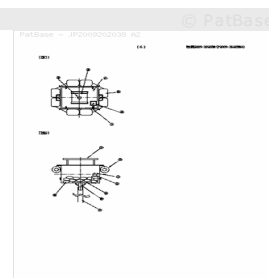
Probable Assignee: MITSUI SHIPBUILDING ENG

Earliest Publication Date: 20061005



67) Family number: 43853023 (JP2009202038 A2)

FLOATING BODY TYPE WATER PURIFIER BY WATER CIRCULATION, FILTRATION, AND AERATION USING PHOTOVOLTAIC POWER GENERATION



Abstract: Source: JP2009202038 A2 PROBLEM TO BE SOLVED: To eliminate an oxygen deficiency for improving water quality in a closed water area, such as a lake, a dam lake, a bay, or the like, by drawing up water in a bottom layer and discharging it to a surface layer, and supplying fine bubble air to the bottom layer. SOLUTION: A floating body type water purifier by water circulation, filtration, and aeration using photovoltaic power generation sucks water in the water surface in a cylindrical structure making the water surface communicate with the water bottom by a storage pump driven by a solar cell or the like to circulate, agitate, and mix the sucked water with the water in the bottom layer. The cross section of a water introducing structure is made to be large so that the amount of introduced water is larger than a pump discharge capacity, which eliminates rapid agitation of the water in the bottom layer and the water in the surface layer, and causes sucking of foreign materials in the bottom layer by slow water introduction to prevent clogging of the pump and a discharge port. A filter medium is laid inside a water storage tank to filter the bottom layer water, thereby decomposing and purifying organic matter and the like. When water is discharged, air is sucked by an ejector type fine bubble generating nozzle to be mixed and discharged as fine bubbles, thereby performing water purification in the whole closed water area with only natural energy.

Probable Assignee: KYUUYAMA KK

Earliest Publication Date: 20090910

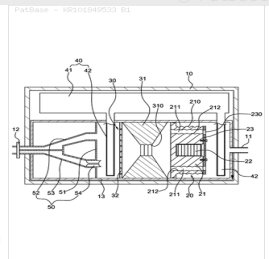
68) Family number: 70035855 (KR101849533 B1)

APPARATUS FOR GENERATING ION WATER AND MICRO BUBBLE WATER FOR SHOWER

Abstract: Source: KR101849533 B1 The present invention relates to a device for generating ionized water and microbubble water for shower. The device comprises: a housing which includes an inlet port for receiving raw water on one side thereof, and a switching valve on the other side thereof; a first ionized water generation unit which is disposed on one side of a main pipe provided inside the housing between the inlet port and the switching valve, to cause the raw water entering through the inlet port to be ionized by a permanent magnet and micro-currents generated due to the passing raw water generating eddy currents; a second ionized water generation unit which causes the raw water entering from the first ionized water generation unit to flow faster and become ionized due to changes in water pressure causing compression, and formation and expansion of eddy currents, and causes the ionized water to disperse while passing through a plurality of fine holes, such that a flow speed is increased; an air bubble generation unit which is provided at an upper part or a lower part of the housing to generate air bubbles at a leading end of the first ionized water generation unit and at a rear end of the second ionized water generation unit; and a water supply unit which supplies the ionized water containing air bubbles while passing through the second ionized water generation unit to a shower water pipe or a bubble water pipe, such that the ionized water or the microbubble water can be selectively supplied by means of the switching valve. Accordingly, the present invention can provide a device for generating ionized water and microbubble water for shower, with excellent water-saving and water-purifying abilities, moisturizing ability, and cleaning ability.

Probable Assignee: ENERGYWONDR

Earliest Publication Date: 20180611



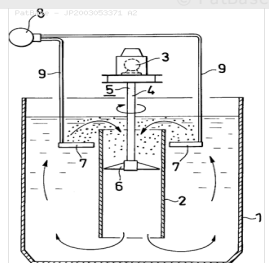
69) Family number: 28349141 (JP2003053371 A2)

AERATION MIXING APPARATUS

Abstract: Source: JP2003053371 A2 PROBLEM TO BE SOLVED: To provide an apparatus which utilizes existing air supplying means to the maximum possible extent and utilizing the characteristics of a draft tube type mechanical aeration mixing apparatus. SOLUTION: The aeration mixing apparatus is furnished with a draft tube 2 which is arranged perpendicularly within a treating vessel 1 and mixing means 5 which exists in the draft tube and is rotated by a motor 3 through a drive shaft 4. The mixing means 5 generate descending flow in the draft tube by rotation of its mixer blades 6 and circulates the liquid from the bottom end of the tube through its outside to the top end. An air diffusion plate 7 is disposed as air diffusing means on the upstream side of the mixer blades of the mixing means. An air bubble guide is preferably disposed between the air diffusion means and the mixer blades. The air diffusion means is preferably an air diffusion plate or air diffusion pipe of generating fine air bubbles below 100 micro m. Such air diffusing means is preferably a 'disk Diffuser (R)' made of Ataka Industry Co., Ltd.

Probable Assignee: ATAKA CONSTRUCTION AND ENG

Earliest Publication Date: 20030225



70) Family number: 33612519 (US2011000436 AA)

FOAM FILTER FOR AQUARIUM HAVING FUNCTION OF PURIFYING AIR AND WATER

Abstract: Source: US2011000436 AA A foam filter for an aquarium having a function for purifying water and air which is capable of facilitating a replacement and maintenance of components due to an abnormality of a filtering device and an execution of a washing operation (including water refill) of the aquarium by making it convenient to be manufactured and installed depending on a simplified construction of a product which can be selectively disassembled or assembled, and also capable of satisfying user's visual curiosity by improving an externality of the aquarium, wherein the foam filter for the aquarium having the function for purifying water and air can be achieved by being provided with an installation case provided with a pair of container installation holes which are symmetrical to each other at left and right lateral surfaces based upon a filter installation hole, and having a fluid inlet which is formed through the filter installation hole at central front portion of a bottom surface of the installation case, a multi-layer filter slidably received in the filter installation hole, a filtering agent container slidably received in the pair of container installation holes, a filtering case connected to a front portion of the fluid inlet to thus be mounted thereto, and a water screen generator 5 mounted to one lateral surface of the installation case, wherein multiple minute foam generating holes for supplying minute foam into the installation case is further provided.

Probable Assignee: SHARON KOREA ITEM CO LTD

Earliest Publication Date: 20050324

