



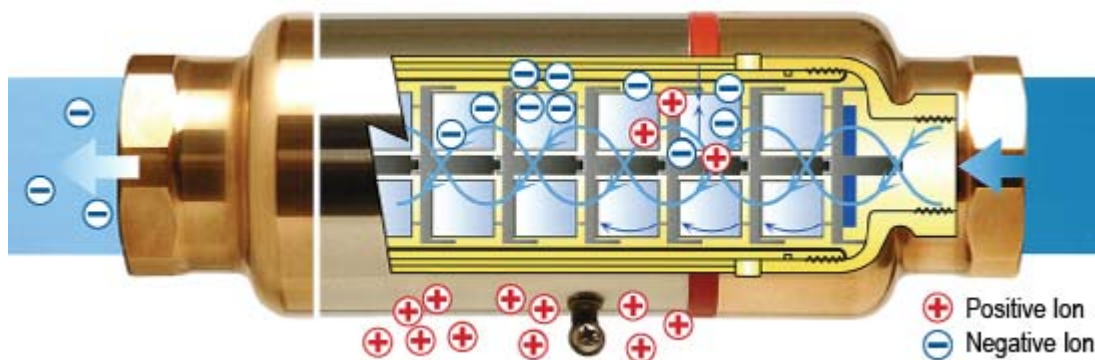
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Kikuo TAMURA Water Activator

Infrared Ceramics + Ion Generation activates water for reduced irrigation / fertilizer agricultural requirements & increased yield, improves animal fertility, &c...

http://www.dileka.eu/en/index_en.php

DILEKA



An infra-red photon and electron generator to treat industrial, farming and home water

DILEKA, an infrared and electron generating device for water, according to Japanese technology developed for over 25 years.

DILEKA, a main key to Environment Protection and Sustainable Growth

DILEKA, an ongoing effect to **reduce the bio film amount and decrease oxidation in water ducts**, helping reduce bacteria proliferation, such as legionella.

DILEKA, to **halve the use of detergents** and cleaning products at home, but also in the industry and services.

DILEKA, to **reduce lime incrustation in ducts** and machines.

DILEKA, to **save at least 20 % farming water, 20% fertilisers and 20% plant-health products** [? increased yield ?].

DILEKA, to **increase naturally the various breeding productivity** parameters.

Dileka is a tube whose length varies depending on the volumes of water to be treated: when the water goes through it, it undergoes a vortex movement several times; thus the water goes from a laminar flow to a swirling flow: this generates a depression and micro-bubbles; it also receives infra-red waves produced by very specific ceramics placed inside the body of the device: those waves are evocative of those waves naturally produced by the earth itself. As a result of that

mechanical and electro-magnetic energy that it receives, the water is strongly agitated and ionised; it then acquires new physical properties.

CYTOBIOTECH

Founded in 1995 by Veterinarian Dr Hervé JANECEK, our company is based in Montpellier in the south of France.

CYTOBIOTECH is a company specialising in Biology and Nutrition, with advanced expertise in the area of Bio-energy; since year 2000, our team's trade has focused on water treatment, by developing in France various innovative technologies intended to valorise that unique resource thus our world should be understood from a bio-chemistry angle of course, but also from a bio-physics angle this is true of the first of our fids, and also the first element of our living environment, i.e. water.

Since 2003, CYTOBIOTECH has imported from Japan the DILEKA, which was designed and developed by the EKG company and its manager, Mr Kikuo TAMURA, architect.

This innovative technique transforms the physical characteristics of water by giving back its original energy the food water drunk every day by each of us, but also the water used in the industry, farming, breeding and services, take advantage of the transformation.

DILEKA allows individuals to drink health water and also save on detergents, and protect the duct system of their houses from lime and oxidation.

DILEKA helps farmers and companies reduce environmental pollutions (pesticides, fertilisers, detergents, solvents), and also make many productivity and quality savings on the products sold.

Mr Kikuo TAMURA



Now through information and by promoting the DILEKA clean towards all concerned European players, CYTOBIOTECH's job is to put the economy increasingly at the service of the environment.

CYTOBIOTECH also distributes the PHP, which is also developed by EKG, and which allows important energy gains in terms of heating and air conditioning.

CYTOBIOTECH is the exclusive importer of the DILEKA ad PHP technologies into the European Union, Switzerland and North Africa.

VIDEOS

<https://www.youtube.com/watch?v=fGZhOKPQmL4>

Dileka And Home

<https://www.youtube.com/watch?v=k5LgWQDO8UA>

Highly Ionized Dileka reduce waste of water

<https://www.youtube.com/watch?v=G119jPIacD0>

Dileka and Chicken farm

CN102666392 / WO2011135666 **Water activation apparatus**

[0001]

TECHNICAL FIELD

[0002]

The present invention relates to a configuration in Waterworks, in particular the water supply system to make water activated running water.

[0003]

Background technique

[0004]

Landing in the mountains of rain, snow to penetrate from the underground springs and groundwater eventually become rivers of Origin form.

In this process, this water by far infrared rays from minerals or rocks, negative ions, magnetic effect makes hydrogen bond clusters of water molecules (Group) split and accepted by the collision with the rock, falling from a waterfall and other water molecules to each other by friction electrons, thus reducing water as water can play a specific function, called a water-activated capability (known as "living water", "activated water") and well known.

[0005]

However, the water has not been determined to prove there is a scientific basis and get public recognition, for a particular member of the treated water, add water, or as a change in drinking water when used, although feelings judgment based on experience, but it can get a certain degree of extensive good the effect is still the facts.

[0006]

Additionally, this running water extremely difficult to maintain for a long time with its active state, so the effect is more uneven, so will greatly affect the effectiveness of running water if a real effect.

[0007]

Therefore, Zixi so far, in order to obtain a more efficient water activity and maintain it for a long time for the purpose of the pipeline inside the device connected to the configuration of calcined minerals from the spherical, flat disc-like small block of ceramic material (hereafter as "ceramic balls, etc."), or use of a static magnetic field formed by water moving through a magnetic field space structure of the various devices (hereinafter referred to as "flowing water") Now that practical.
[0008]

For example, it has been revealed to have a means of running water, characterized in that a plurality of ceramic balls accommodated inside the like, and has a water-passing hole formed in the housing can be accommodated between the water filling pipe between the cylindrical casing (e.g. see Patent Document 1).
[0009]

In addition, there is a running water system has been revealed, which will be formed in the same manner with the invention of Patent Document 1 has an approximate circulation holes far-infrared radiation ceramic group circled switched to multi-layered configuration as to be interposed in charge of water pipes, etc. between the housing and formed on the plate by the impact of the blade so that the various ceramic disc rotation (for example, see Patent Document 2).
[0010]

The prior art literature

[0011]

Patent Document

[0012]

Patent Document 1: JP 2001-058191 (page 3-5, Fig. 1)
[0013]

Patent Document 2: JP 2000-107752 (pp. 2-3, Fig. 1)
[0014]

SUMMARY OF THE INVENTION

[0015]

Invention is to solve the problem
[0016]

However, it disclosed a traditional running water due to contact with waterways is limited, thus can not be converted to running water has sufficient ability to activate the question.
[0017]

For example, Patent Document 1 running water occurs at a position offset ceramic balls, etc., the water pressure loss, which results in less fluid or water retention.

In addition, there are long years by the wear between contacting ceramic balls like each other caused, due to reduced activation effect is reduced, thus the need for the ceramic ball to replace, supplement or cleaning and other maintenance issues.
[0018]

Patent Document 2 running water of the ceramic plate configured to rotate to agitate the water, as compared to the ceramic balls disposed such circumstances Patent Document 1 or the like, can not avoid contact with flowing water relative to the material with water is reduced, thus far infrared,

negative role in influencing the magnetic effect of reducing the danger.

In addition, the impact of the blade is formed with a high manufacturing cost ceramic disc, and is used for many years still occurs sometimes injury rotating mechanism to maintain the rotational state can not, at this time there will function to reduce the problem.

[0019]

In addition, the recent deterioration of water pipes along the device, set up the deterioration of the environment, within the water of bacteria, such as E. coli, Legionella proliferation concerns will have more, and Patent Documents 1 and 2 means no running water sterilization, or bacteria proliferation, or only a little of the action.

[0020]

Thus, the present inventors will focus on the above-mentioned problems, and aims to provide a limited flow path length can be obtained more efficiently and maintain an active state of prolonged running water, and obtain a bactericidal or bacterial growth inhibitory effect of running water running water ???

[0021]

Way for Solving the Problems

[0022]

To solve the above problems, the present inventors running water has the following composition:

[0023]

Forming a conductive connection means having an inflow side and the outflow side of the cylindrical conductive body, the inflow side and the outflow side of the body were filled with external water conduit in communication, and to electrical insulation to cover the connecting unit and the main body flowing water unit, which is formed in the housing in the manner of the body not in contact with each other a plurality of configuration components running water;; conical front umbrella body, which in this case composed of flowing water unit part or all of the conductive cover member The inflow-side end portion toward its distal end disposed in the inflow direction; and a conical rear section umbrella body, disposed on the outflow side end portion of the preceding element to running water inflow direction toward the front end of the way.

[0024]

The aforementioned body covered with a ground (through ground).

Thus, the state of the plasma formed in the running water (positive ions (+) and electrons (-) ionized state) of the positive ions by discharge to ground, while the residual electrons (-).

[0025]

In addition, for the formation of a conical body umbrella, the umbrella body front (inflow side umbrella body) in a substantially central portion of the front end disposed toward the inflow direction of a single, umbrella body while the rear section (outflow side of the umbrella body) to the inflow direction toward the distal end The way the outflow side to configure multiple.

The front tip of the umbrella body to essentially open angle of 90 degrees, and the rear section of the front end of an open umbrella body angle is set to be substantially 45 degrees.

Further, the open angle of the umbrella body most preferably said angle setting, but unless, may also be set to have a width slightly.

[0026]

Preferred examples of either or both of the material of said pre-stage and rear stage umbrella

umbrella body is formed by a body comprising titanium, silver, copper and other antimicrobial materials.

The pure metal is preferably formed of a material such umbrella bodies, but may also be processed by plating, ion plating or the like is formed to cover the surface of the specifications.

In addition, most preferably pure titanium cases of specifications.

[0027]

Flowing water unit in a manner not in contact with each other in the direction of flow of cross-sectional configuration of a plurality of parts to constitute a layer of flowing water, the flow direction and laminated to constitute the laminated shape, i.e., a multi-layer configuration.

[0028]

Arranged in a plurality of layers of flowing water component cross section is formed substantially in line with the outer diameter of the body, and housed, kept within the basin has a through-aqueous holder.

Bottom surface of the retainer with a plurality of fins, the fins have inclined to the bottom surface of the water flowing through the flow line leaving the role of the change of direction.

And more, the inclination of each set arranged more layers of each fin retainer together for mutually inclined toward the same direction.

In other words, the tilt having the same shape as the plurality of fins laminated retainer disposed within the body.

[0029]

Member by the above-described running water after contact with water may produce some action member is formed, and as preferred examples, mainly used in multi-element minerals (ceramics, artificial tourmaline, etc.) as the main component of the fired body, its shape is formed along the the main axis of the housing in the direction of the cylindrical axis.

And, there is formed around the outer periphery of the side that contains the entire water flow to change direction of the concave strip helical groove, helical ridges or peaks strip.

In addition, depending on the demand, or to further enhance the functionality for the purpose of running water is formed so that the shaft member penetrating the through hole, the inner peripheral surface of the through hole may also be formed with the outer peripheral surface of the same helical groove and the like.

[0030]

Effect of the Invention

[0031]

Case running water through the invention configured as described above, the effect of volatile following features:

[0032]

First, the water from flowing into the front side of the umbrella body of the collision, while the water particles are accelerated along the additional rotating conical surface, followed by a conical surface when exiting the rear edge of the umbrella body, that additional rapid rotation.

Thus, the water particles gathered from the intense vortex flow is formed, continuing toward the

flowing water is disposed behind the mobile unit.

[0033]

These eddy currents running water after contact with a high efficiency unit metamorphism (activation force conversion) to form living water.

In detail, the high-speed and flowing water by the member contact (water particles high friction slip), form a positive charge and the electrons constituting the free state of atoms of water molecules.

In this case the state as a plasma or plasma state of vibration.

[0034]

More and, when the umbrella body formed from titanium alloy-based antimicrobial component, could play ionized water, inhibit the proliferation of E. coli, Legionella, etc., or to reduce the effect of pesticides.

Extremely effective in improving water quality and other aspects of public bathhouse.

[0035]

In addition, the case has constructed running water quality improvement.

I.e., can be reduced or removed (nitrogen compound) as a substitute for chloramine and chlorine for disinfection, but also confirmed that the effect of reducing the reaction with chlorine generated chloroform.

In addition, general chloramine does not generate halogenated methane, it does not produce discomfort such as chlorine-like odor, so you can improve the taste of tap water, however, in terms of monochloramine for ornamental fish is poisonous, and for humans, when the water used for artificial dialyzer sterilization should also be removed, etc., not only benefits.

[0036]

And, the acceleration and the acceleration vortex conical surface disposed in the rear edge of the rear section of the body section of the umbrella can by means of the water flowing water, and further through the conical surface generated generated, so that running water state is maintained longer and to move it in the rear of the line.

[0037]

More persons, arranged in part due to the flowing water within the housing is configured as described above, in the configuration in the flow path by forming the outer peripheral surface and (or) the inner circumferential surface of the through hole of the spiral groove or spiral ridges, running water member it increases the surface area in contact with the water, and running water pivoting member itself, and produce more than a predetermined direction (D-shape in plan view) of the vortex along the flow path.

Therefore, the water will be able to increase the contact surface area and the vortex of the foregoing and effective activation.

In particular, the vortex by water molecules collide with each other, the friction produces electronic and promoting activation, and therefore contribute to a more efficient activation when the limited flow path length.

[0038]

Further, the flowing water held by the holding member having a water flow line can change the

configuration of the fin and multilayer, whereby the vortex generation region as large as possible and to improve the degree of activation, but can be maintained for a long running water state.
[0039]

In addition, the umbrella body segment due to a sharp outflow side is arranged to start multiple angles, it can be through the housing flows through highly activated stirred further additional small vortices, can promote chlorine harmless and will receive the traditional means No running water in the novel.
[0040]

Brief Description

[0041]

Figure 1 is running water a perspective view of part of the gap;

[0042]

Figure 2 is a sectional view of a shaft running water;

[0043]

Figure 3 is a partial combination of running water a perspective view;

[0044]

Figure 4 is a holder of running water part of the gap with a front perspective view and a perspective view of an umbrella body composition;

[0045]

Figure 5 is a running water holding the umbrella body with the rear section of a perspective view of the combination;

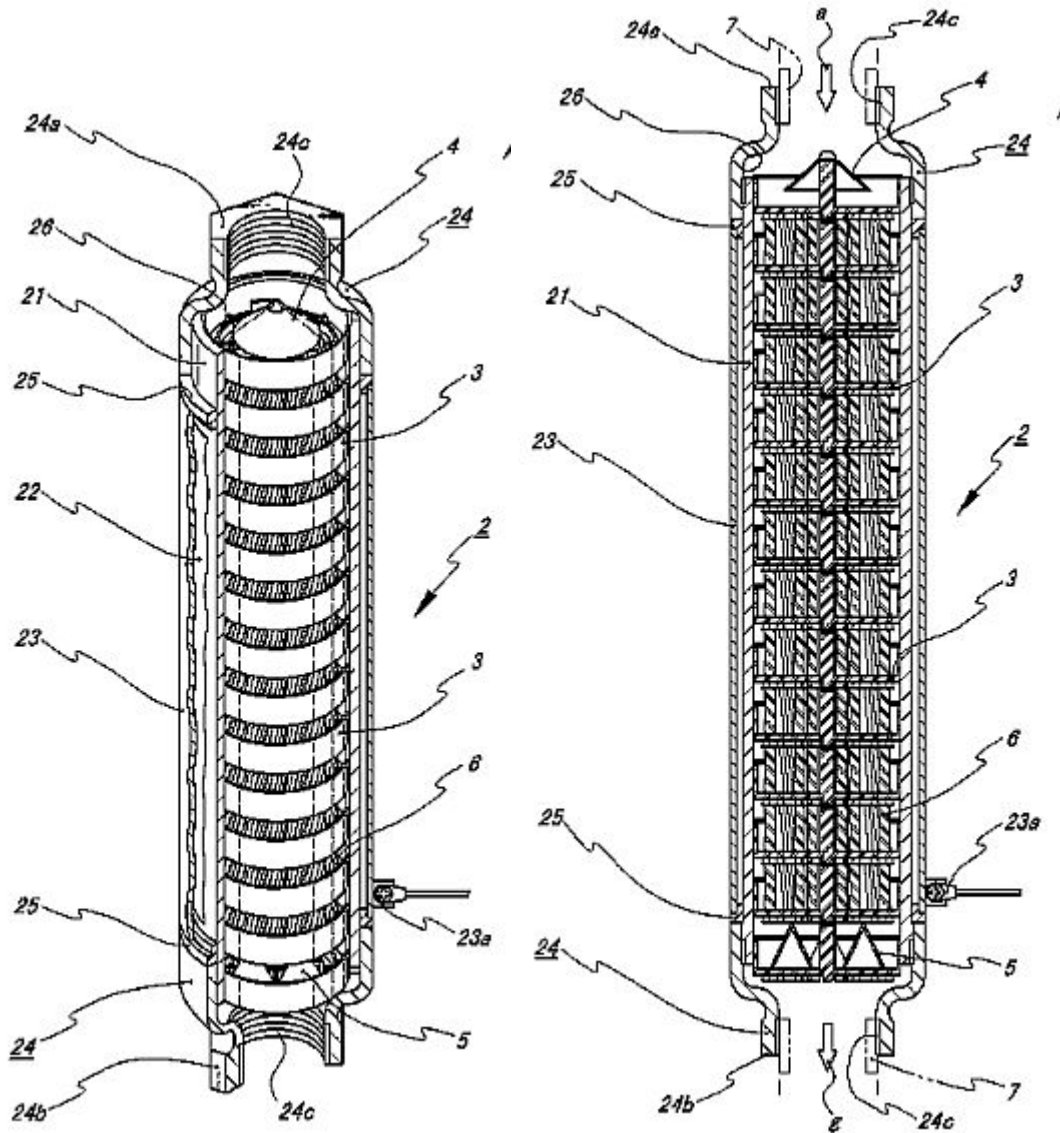
[0046]

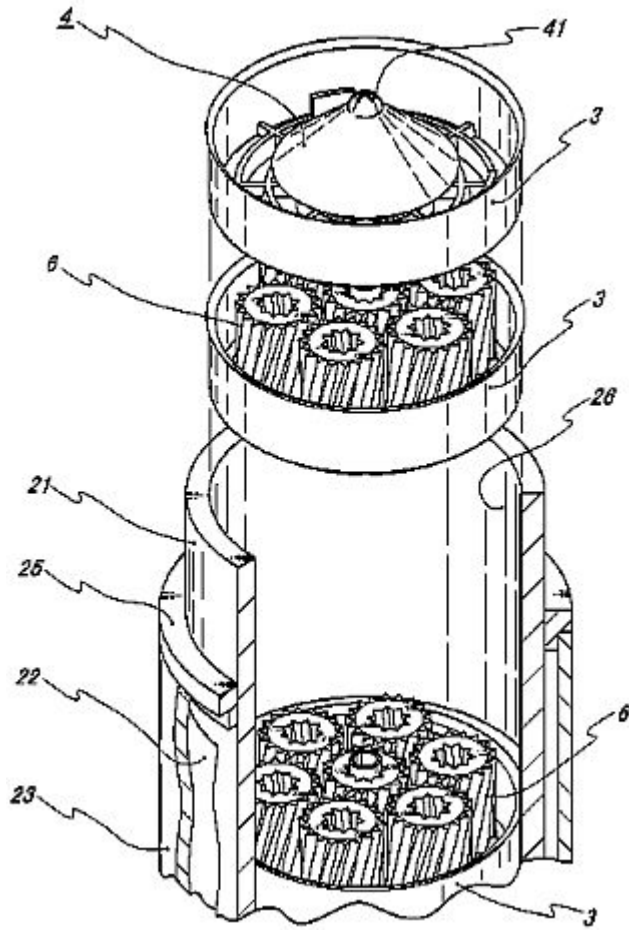
Figure 6 is a perspective view of a combination of running water and running water retainer member;

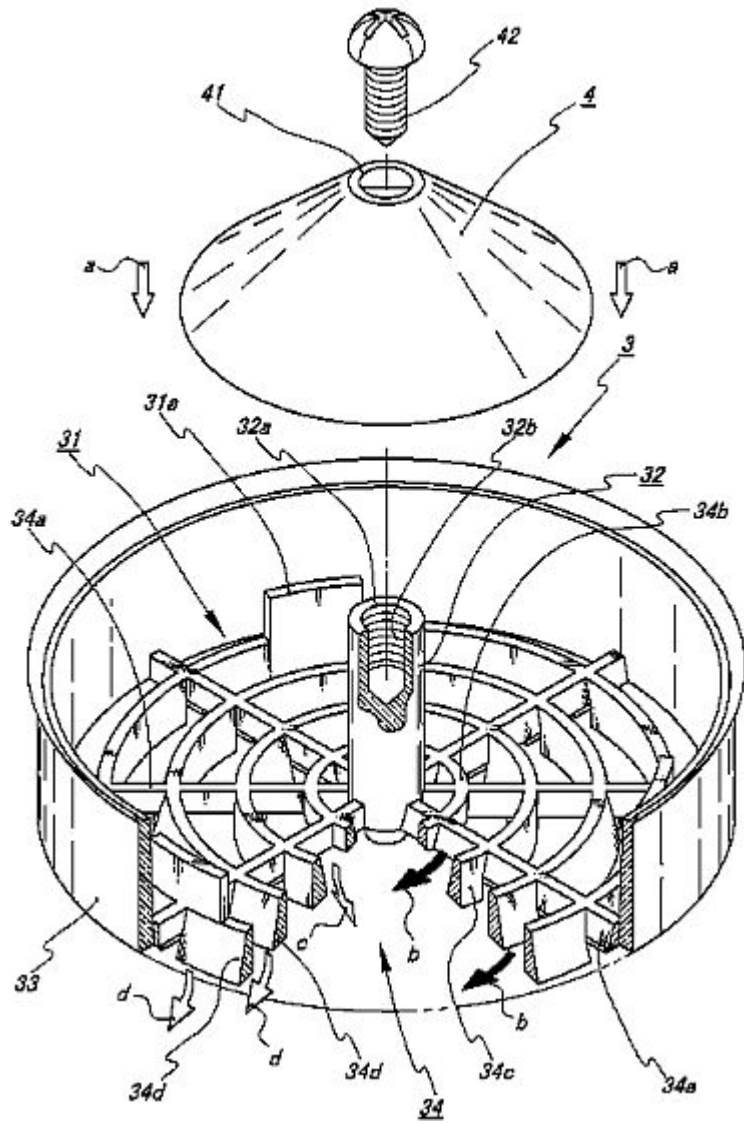
[0047]

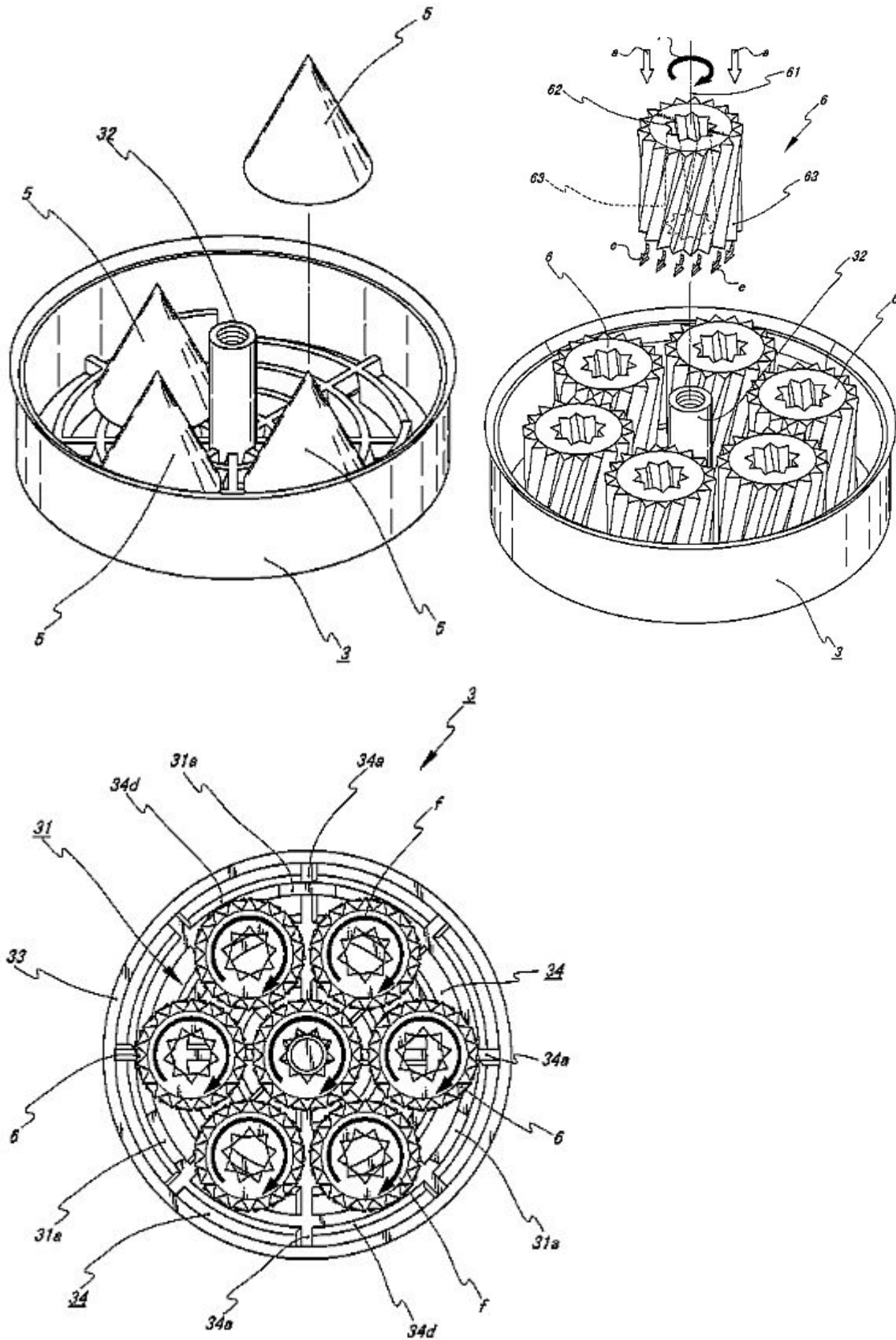
Figure 7 shows the configuration status of running water to keep parts flowing water within the plan view.

[0048]









DETAILED DESCRIPTION
[0049]

Hereinafter, specific embodiments of the present inventors of flowing water, will be described in detail based on the drawings.

[0050]

Figure 1 and Figure 2, the flowing water of the present embodiment is mainly composed of, we will maintain a plurality of components as running water running water unit holder 6 3 multilayer shape (another state adjacent to the stacked) configuration within the interior space of the housing 2 while the front body 4 arranged in the upper part of the umbrella unit running water side, and the rear section umbrella body 5 is disposed in the lower side.

The flowing water is generally used as a tap water pipeline of charge 7 are connected in series and buried in the ground, or link to, disposed in the middle of building pipelines.

[0051]

The housing 2 is composed of the following components: the main body 21, a metal which is formed to be the length of the cylindrical tube; electrically insulating insulation material 22, which covers substantially the entire surface of the housing 2 of the outer peripheral surface; and a conductive cover 23, the insulating material covering the outer circumferential surface 22. Further, in both ends of the body 21, so as to cover the opening portion of the connecting pipe 24 provided with the way.

[0052]

The connecting pipe 24 functions as a charge hose connecting unit 7, and filling pipe 7 in a watertight closure and link status.

The connecting pipe 24 is mounted to the main body 21, the connecting pipe 24 and the covering body between the opposing ends of the edge portions 23 of the mount state with a ring of electrically insulating insulating ring 25.

Thus, the connecting pipe 24 and the cover 23 will form an electrically insulating.

[0053]

Mounted on the main body 21 of the open end of the connecting tube 24 of the inner peripheral surface is engraved with an internal thread 24c for charging pipe 7 and water-tightly coupled to the latch.

The connecting pipe 24 to the water inflow side (surface side) as the inlet 24a, to the other side (the lower side of the drawing) as the flow outlet 24b.

Housing 2 by the flow inlet 24a and the outlet 24b disposed on the same line or the same curve, you can achieve lower pressure loss during water.

[0054]

In addition, the cover bodies 23 23a connected to the ground terminal, positively charged ground to cover body 23 produced (by land).

In addition, when running water 1 buried in the ground, you can omit the ground terminal 23a.

[0055]

The cylindrical interior space of the housing 2 is disposed in the front 26 of the body 4 umbrella, the umbrella body rear section 5, and a holding member running water unit 6 is formed by molding a resin holder 3.

The holder 3 is substantially in line with the state of the inner circumferential surface of the internal space 26 of the housing 2, arranged to form a multilayer, and a plurality of coaxially coupled state.

The holder 3 may be configured to consider the number of water flow rate, activation efficiency

appropriately set.
[0056]

Form 3 was the holder with pass-aqueous basin.

More specifically, the following components which are integrally formed to constitute: the holding portion 31, which is formed in an approximately a mesh shape has a plurality of through the outlet 34, and is formed approximately discotic; Quick column 32, from the central portion 31 of the holding In vertical form erect portions are formed from, and having a predetermined height; cylindrical side wall 33, which is lower than the height of the coupling post 32, to surround the outer periphery of said holding portion 31 is formed in the way, and the upper end portion is formed with a open to the outside cone; and three ribbon holding wall 31a, its position on the inside of the sidewall 33, formed from 31 onwards erected like holding portion.
[0057]

The holder 3 by the holding portion 31, side wall 33, the holding wall 31a, a predetermined one or a plurality of configuration state holding member 6 running water, at the same time position directly below the inlet 24a and outlet 24b bit stream immediately above the retainer 3 holding an umbrella body 4 anterior, posterior segment umbrella body 5.
[0058]

Holder 3 is formed by the upper connecting column 32 of porting engraved with the other provisions of the diameter of the female thread holder 32b connecting port 32a, with three vertically arranged coaxially fitted state and linked to the multi-layered, and, just below the inlet 24a of the holder 3 is a front screw 42 umbrella body 4 is fixed at the link on post 32.
[0059]

Through the nozzle 34 from the holder 3, the following components: a plurality of rotating fins 34a, by the connecting post 32 extending radially from and connecting with the side wall 33; inner ring 34b, 34a, and the rotary fins connecting the circumferential direction, and with the coupling post 32 at predetermined intervals sequentially arranged concentrically; inner fins 34c; and two outer fins 34d.

In addition, the inner fins 34c and 34d of the outer side of the fin to the lower end of the side walls 33 and relatively more toward the rotary fins 34a protrude downward the size of the vertical direction is slightly longer.
[0060]

Inclined plane was right-handed (clockwise, arrow b) there is a plan view of the water from above (arrow a) forming the rotating fin 34a.

In addition, there is formed inward deflection direction (arrow c) of the inclined surface on the inside of the fin 34c, 34d is formed on the outside of the fins have a bias toward the outward direction (arrow d) an inclined surface.

Formed in each fin 34a, inclined surfaces 34c, 34d of the water flowing through the inner space of 2 relative to the housing 26, respectively, and the rotational direction, inward, outward bias, thus will produce a so-called state of agitation turbulence ???
[0061]

In addition, the inner fins 34c and 34d of the outer fin configuration, the number is not limited to this embodiment, the change may be appropriate, for example, as the entire inner fin 34c, on the contrary as all the outer fins 34d, the inner fin 34c disposed on the outer circumferential portion or the outer peripheral portion disposed between the inner fins 34d.

[0062]

Just below the inlet port 24a of the holder 3 is arranged in the inflow direction toward the distal end of the conical front body 4 umbrella.

The umbrella body 4 has installed front port opening at the top of the head 41, by opening the mounting screws 42 and 41 is inserted into the female thread 32b formed in the Quick Links column of the locking port 32a 32 that is fixed to the holder 3.

The front top of the head 4 of the umbrella body open angle is set to substantially 90 degrees, the diameter of the edge of the conical surface in the holder with the bit closer to the center of the outer side of the fin 34d 3 having the same size in plan view ???

[0063]

Furthermore, just above the outflow port 24b of the holder 3 is disposed in the inner side of the retaining wall and the front end 31a toward the inflow direction of a plurality of (in this embodiment, four) rear conical section of the umbrella body 5.

No rear section umbrella body 5 contact each other, but in the center post 32 links arranged circumferentially equally divided state.

The rear section of the umbrella body 5 and the inlet just below the front of the umbrella body of different 4 is top of the head to the open angle substantially 45 degrees.

[0064]

Further, in this embodiment, the umbrella body 4 anterior and posterior segment umbrella body 5 are made of alloy.

The reason is that titanium contact with the water can play a catalytic role, with E. coli, Legionella and other sterilization, or bacteria proliferation, and having a chlorine ionization function to make it harmless.

[0065]

Also, with the exception of two umbrella holder has other 4 and 5 on the outside of the holding section 3 of the 31 are provided with one or more of the components running water 6.

Approximate cylindrical body part 6 of the flowing water for the multi-element minerals (ceramics, artificial tourmaline, etc.) as the main component of cylindrical fired body, pierced through hole 62 contains its shaft 61 is formed.

The flowing water member 6 is set to a height dimension than the holder 3 is slightly lower coupling post 32, having a diameter of approximately half of the holding portion 31 of the radius of the through hole 62 is formed slightly larger than the connecting column 32.

[0066]

Further, the outer peripheral surface and the inner circumferential surface of the flowing water is formed member 6 D-shape in plan view (clockwise) of the spiral ridges 63.

By the spiral ridges 63, running water surface area member 6 will be substantially increased, and the flow of water from flowing water above the member 6 (arrow a) forming a substantially right-handed bias flow (arrow e).

Further, in this embodiment, the spiral ridges 63 are formed on the outer peripheral surface of the ridges or continuous inner circumferential surface, but may also be formed discontinuously.

[0067]

The flowing water above configuration member 6 in the present embodiment, the following configuration is maintained in a multilayer structure are arranged in the inner space of the housing 2 of the respective retainer 26 3,3, ..

In.

[0068]

I.e., configured to, via a through hole 62 running water coupling member 6 embedded in the holder 32 of the column 31 is disposed, and around the inside of the holding wall 31a in a manner not in contact with each other to configure a plurality of (in this embodiment for six) running water component.

In other words, in the holding portion of the holder 3, to a member (6) for flowing water, flowing water in which a plurality of members around 6,6, ..

Arranged circumferentially equally divided state.

[0069]

The case by the flowing water component configuration structure 6, water will be in the running water is not covered parts of the surface 6 contact with each other, in addition, through the spiral ridges 63, running water that is part of their own along the right direction (clockwise, arrow f) around axis.

[0070]

[Role]

[0071]

With the above configuration running water 1 to play the following role.

[0072]

First, the flow of water from flowing into the inlet 24a of the housing 2 (arrow a) collide with the front umbrella body 4, extend, and accelerate, thereby producing a plurality of eddy currents in its extended conical surface edge.

4 umbrella body with the front collision can be suppressed by water catalytic role titanium bacterial growth, while the chlorine ionization and it harmless.

Additionally, you can look forward to the effect of improving the water quality and reduce chloramine (nitrogen compounds), humus and other organic matter and chlorine reaction generated trihalomethanes.

[0073]

The experimental results as running water has suppressed the proliferation of bacteria E. coli and Legionella, the growth inhibitory effect may be mixed to make provisions bacteria stock solution of hot water by the present embodiment a confirmation performed.

[0074]

Second, the umbrella body of water flowing through the front holding portion 4 and the holder 3 reaches 31 flowing through the nozzle in 34, through the rotation of the fins 34a, inner fins 34c, the outer fins 34d, coupled with the right-handed stream (arrow b), within biased flow (arrow c), the outer bias flow (arrow d), bias, they basically generate a plurality of right-handed vortex state was, that is, to form a right-handed-based component (main component) along multiple directions stirring turbulence state.

[0075]

Turbulent state of the water front collision umbrella body 4 and form a vortex generated by the holder 3 produced side and held in the second layer below the holding portion holder 3 6 collision member 31 running water, living water flowing through the side parts between 31 and reaches the holding portion.

In this case, the configuration does not contact 6 through the respective members to each other and running water formed in the outer circumferential surface of the inner circumferential surface of the spiral ridges 63, along the right direction about its own axis of rotation (arrow f) in the configuration of the member 6 running water, while water is formed in a manner biased dextrorotatory (e) of the flow effect.

[0076]

Then, in order to favor the status dextrose stream reaches the retainer holding portion 31 3 formed by further applying water turbulence stirred by the state through the outlet 34.

Thereafter, whenever flows are arranged in multiple layers in the interior space of the housing 26 of each holder 3, the same effects as described above will be applied to the water.

[0077]

Finally, after passing through the umbrella body holding section 5 is 3:00, the umbrella body of water by the rear section 5 and shunt acceleration, and body edge of the conical surface 5 of the eddy current in the additional fine umbrella subsequent stage, and then from the outlet port 24b outflow (arrow g).

[0078]

As described above flowing water flowing water flowing through the resonance effect 1 if the umbrella body has two kinds of shape between the catalytic role of its material or titanium alloy produced as bacteria (E. coli, Legionella) proliferation only It can be suppressed, which can soften the hardness (reduced from 110 to 20).

[0079]

In addition, the outflow of water from the flowing water through the far infrared part 6 so that hydrogen clusters of water molecules (Group) split water molecules to each other while the electrons generated by the friction reducing water formed.

This is also based on the degree of activation member 6 flowing water, flowing water to maintain these configurations member 6 of the holder 3, as a plurality of inside and outside of the right-handed-like vortex is formed a plurality of turbulence bias state, in other words, it can play an effective role stirred, and to expand as much as possible the negative charge generated, so that the activation is further enhanced.

[0080]

In addition to the above effects, but also the shape of the retainer 3 (outer periphery) of the interior space of the casing 2 is substantially in line with the inner peripheral surface 26, whereby the total amount of water flowing through it flows through the holder 3 is provided in the holding portion 31 through the outlet 34 and 6 parts collide with running water, the activated expanded role.

In addition, by increasing or decreasing the degree of activation can be configured into a number of multi-shaped holder 3 to be adjusted appropriately.

[0081]

And more, by making the internal space 26 of the casing 2 and the cover member 23 between the electrically insulated, it functions as a running water electric double layer capacitor functions, and the generation of positively charged electrons separate the inner space of the inner cover body 23 via The ground terminal 23a discharge, and therefore not prejudice the activation of the body, but

also to prevent galvanic corrosion 1 running water and so on.

[0082]

[Other embodiments of the possibility]

[0083]

Flowing water 6 parts of the above embodiment has spiral ridges 63, but also the spiral ridges 63 in combination with separate fins constitute the outer peripheral surface and the inner circumferential surface.

[0084]

In addition, 6 of the flowing water components lends itself about the shaft portion of the rotary axis of the cylindrical body is formed with a through-hole 62, but also to wear a flowing water unit 6 is provided (for example, in the media form a plurality of through-brick-like mouth, etc.) a plurality of through holes 62.

[0085]

More and running water unit 6 is disposed in the number 3 can be avoided as long as the holder of each member 6 was running water contact state can be appropriately increased or decreased, can be arranged for each multi-shaped holder 3 to change the structure according to the configuration ???

[0086]

Symbol Description

[0087]

1 running water

[0088]

2 housing

[0089]

21 body

[0090]

22 insulation materials

[0091]

23 covers the body

[0092]

23a ground terminal

[0093]

24 connecting pipe

[0094]

24a inlet

[0095]

24b spout

[0096]

24c internal thread

[0097]

25 insulating ring
[0098]

26 internal space
[0099]

3 holder
[0100]

31 holding unit
[0101]

31a retaining wall
[0102]

32 Quick column
[0103]

Link port 32a
[0104]

32b female thread
[0105]

33 sidewall
[0106]

34 through outlet
[0107]

Rotation fins 34a
[0108]

34b inside of the ring
[0109]

34c medial fins
[0110]

34d outer fins
[0111]

4 front umbrella body
[0112]

41 Installing mouth
[0113]

42 screws
[0114]

Paragraph umbrella body 5 after
[0115]

6 running water components
[0116]

61 axis
[0117]

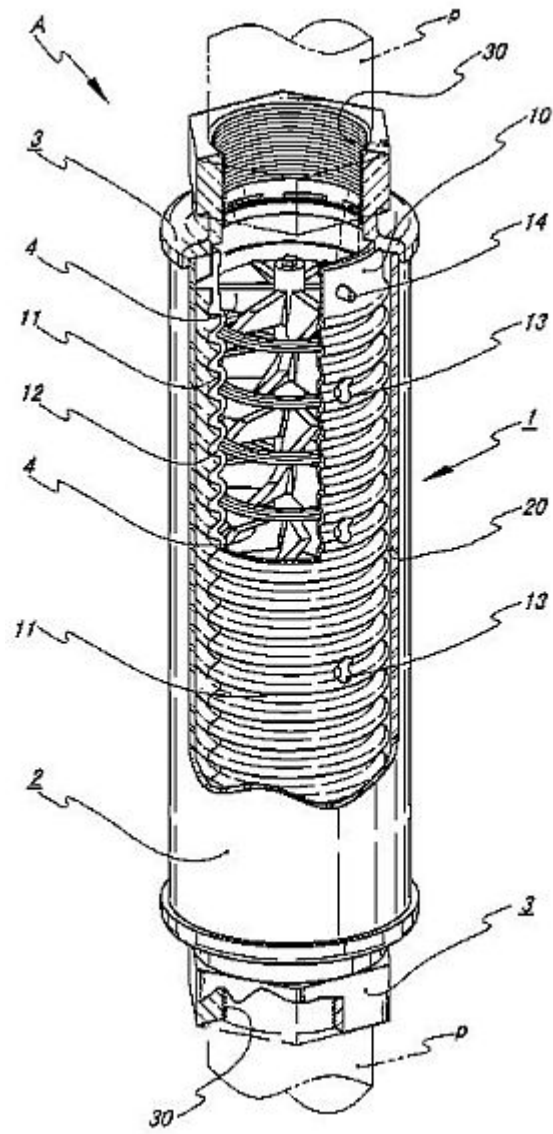
62 through opening
[0118]

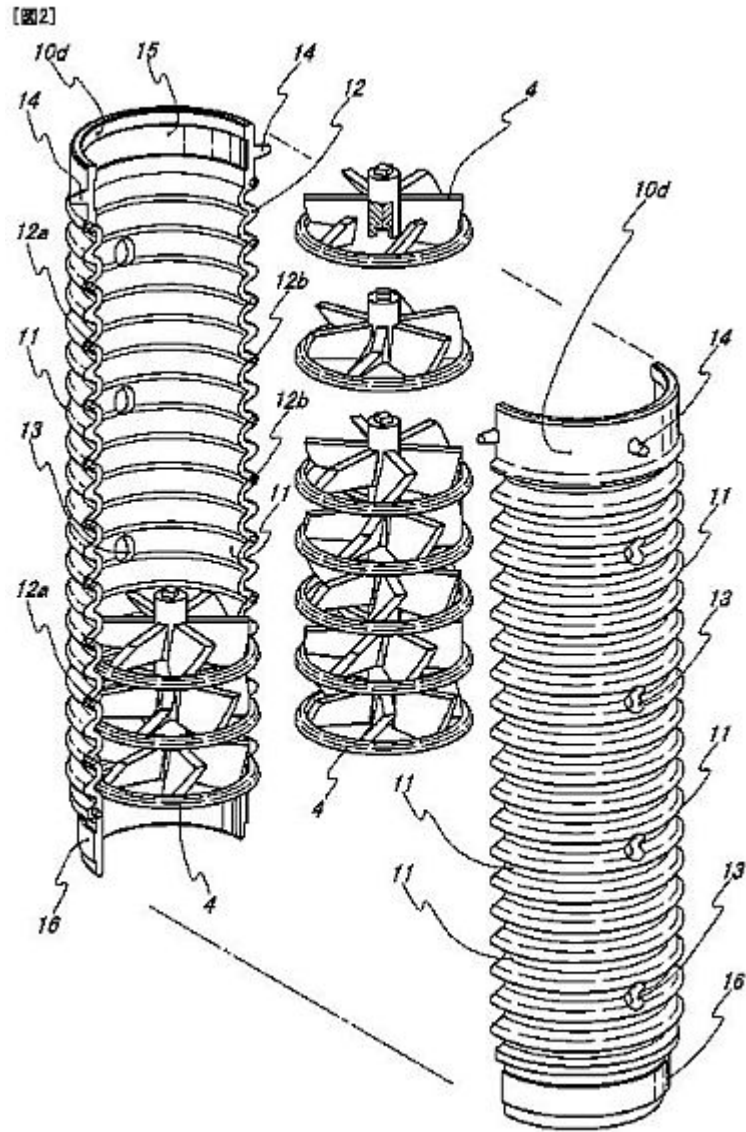
63 spiral ridges
[0119]

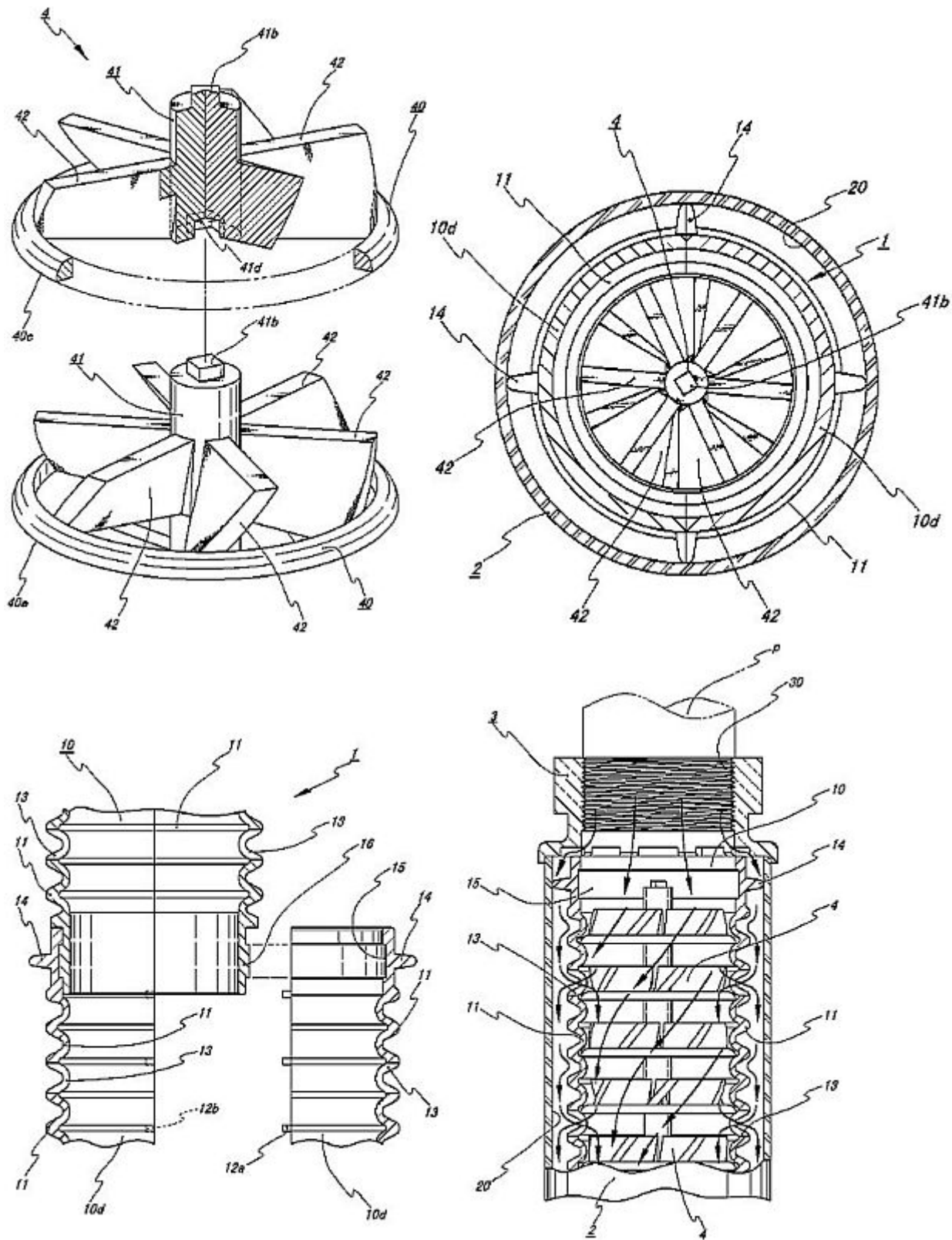
7 filled pipes

**WATER ACTIVATION MODULE AND WATER ACTIVATION APPARATUS UTILIZING
THE SAME
JP4882024 / WO2009125451**

[PROBLEMS] To provide a water activation module that enhances the frequency of contact with water molecules needed for water activation by efficient agitation of through water stream and provide a water activation apparatus utilizing the module. [MEANS FOR SOLVING PROBLEMS] The water activation module comprises a tube body obtained by molding a mixture of functional mineral and resin base material; multiple uneven areas provided on both the sides of the internal and external side faces of the tube body; and multiple through water ports provided by opening the side faces of the tube body. Inside the tube body of the water activation module, there are disposed multiple flow change means mutually coupled in the direction of the tube axis, which flow change means when placed in a flow path change the flow path of intra-tube stream. The flow change means consist of the same material as used for the tube body, and are detachably fitted to the internal side face of the tube body. The flow change means have multiple flow change blades for rotating of fluid flow. The water activation apparatus is built by disposing the water activation module of the above structure in a tube in such a manner that an interstice capable of forming a flow path of fluid is provided between the external side face of the module and the internal face wall of the tube.







**Water activation piece for use in flow passage...
US7981378**

To provide a water activation piece for use in a flow passage for forming a more efficient water flow stirring state for activating water through the piece which is formed in a simple structure with limited flow passage length, and a structural arrangement of the water activation piece, and a water

activation device using the water activation piece and a structural arrangement thereof. The water activation piece 4 is formed as a cylindrical body with a through hole 42 that includes an axis 41. Spiral grooves 43 are formed non-continuously or continuously on an inner surface and outer surface thereof so that when the axis of the water activation piece is established in the flow passage, the water activation piece axially rotates by the flow pressure. The spiral grooves 43 are formed in a rightward rotation (clock-wise) manner in plan view.; A water activation device 1 is configured by arranging one or more water activation pieces in a holder 3 where the axial direction thereof is established along the flow passage so that the water activation pieces do not contact with each other, and multiple layers of the holders 3 are established in an internal space 26 of the body.

FIELD OF THE INVENTION

The present invention belongs to a field of water activation device to be established in a water flow passage such as a water supply pipe for water activation, and the present invention relates to a water activation piece for use in the flow passage of the water activation device, a structural arrangement of the water activation piece, and the water activation device using the water activation pieces and its structural arrangement.

BACKGROUND OF THE INVENTION

Ground water made from rain and snow that have accumulated in mountains and permeated the ground eventually becomes spring water and forms head streams of river. During this process, either by subdivision of hydrogen bond group (cluster) of water molecules caused by infrared rays, negative ion actions, or magnetic actions of minerals and rocks, or by receiving the electrons generated by the friction among water molecules created from collision against rocks or waterfall, the water becomes reduced, or namely, activated.

However, the various effects of the activated condition will be gradually lost since the activated condition cannot be maintained for a long period of time. Due to this, a device (hereafter referred to as “water activation device”) has been developed for applying the principle of the above-mentioned activation process, where the water that is losing its activation effects is reactivated by water flow friction which is caused by flowing and stirring the service water against ball-shaped ceramic baked particles (hereafter referred to as “ceramic balls”) arranged in an internal space or magnetic fields formed in the internal space.

For example, a water activation device that stores several cases in a tubular body which is capable of intervening through the flow pipe of the service water has been disclosed where each of the cases stores ceramic balls in the internal space and is formed with flow holes (for example, see Patent Document 1).

Similar to the invention of Patent Document 1, another water activation device has been disclosed (for example, see Patent Document 2), where approximated infrared radiation ceramic group discs formed with small flow holes are established in multiple layers and in a freely rotating manner within a main body where the main body is capable of intervening through the flow pipe of the service water where each of these ceramic discs are rotated by contact wings formed thereon.

Patent Document 1: Japanese Laid-Open Publication No. 2001-058191 (pages 3-5, FIG. 1)

Patent Document 2: Japanese Laid-Open Publication No. 2000-107752 (pages 2-3, FIG. 1)

DISCLOSURE OF THE INVENTION

Problems to be Solved by the Invention

However, the limited length of the water passage in the conventional water activation device gives rise to problems such as insufficiency in activation effect and fails in subdividing the water molecules and thus fails in lowering the voltage of oxidation-reduction.

For example, in the water activation device in Patent Document 1, the water flow often becomes sluggish or retained because the ceramic balls are unevenly distributed, which results in loss of the water pressure. Moreover, the wearing-out of the ceramic balls and contacts of the ceramic balls over a long period of time reduce the amount of the ceramic balls and cause the problems such as reduction of the activation effect and needs of maintenance works for replacing the ceramic balls.

In Patent Document 2, since the ceramic disc is rotated to stir the water flow, the contact between the water activation material and the water is reduced in comparison to that in Patent Document 1, which may lead to reduced effects of infrared rays, negative ion actions, and magnetic actions. Further, the ceramic disc formed with a contact wing thereon is expensive to manufacture, and its rotating state cannot be maintained when the rotation mechanism becomes damaged from the usage over a long period of time, resulting in functional deterioration.

Therefore, in view of such circumstances, the present invention is made to provide a water activation piece for use in a flow passage which is capable of forming a more efficient water flow stirring state for activating water where the water activation piece is formed in a simple structure and its flow passage length is limited. The present invention further provides an arrangement structure of this water activation piece, and a water activation device using the water activation piece and its arrangement structure.

Means to Solve the Problems

In order to solve the above-mentioned problems, the water activation piece of the present invention is structured as follows:

Namely, a water activation piece 4 is a column-like body, for example, a circular cylindrical body of predetermined length, and is arranged in the water flow passage, and an axis 41 of the water activation piece 4 is established in the direction of the flow passage, one or more concaves 43 or convexes 43 that axially rotate the water activation piece 4 by the flow pressure are formed non-continuously or continuously around an outer surface of the water activation piece 4.

Further, a through hole 42 that includes the axis 41 is formed through this column-like water activation piece 4. Namely, the water activation piece 4 is formed as a cylindrical column body and the inner surface of this through hole 42 is established in the flow passage, and one or more concaves 43 or convexes 43 that axially rotate the water activation piece 4 are formed on the inner surface non-continuously or continuously. These concaves or convexes are formed, for example, as spiral grooves 43, and on both the outer surface and the inner surface, the spiral grooves 43 are formed in a rightward rotation (clock-wise) manner in plan view.

The arrangement structure of the above-mentioned water activation piece 4 with respect to the flow passage is as follows:

Namely, it is arranged that one or more water activation pieces 4 are held in a holder 3 of predetermined structure where the axial direction thereof is established along the flow passage in such a way that these water activation pieces are not brought into contact with each other, and further, multiple layers of the holders 3 are established along the flow passage. In the holder 3, a plurality of flow openings 34 having wing pieces 34a, 34c, and 34d for changing the flow lines in the flow passage are established in the directions that are approximately perpendicular to the flow passage.

In a water activation device 1 related to the present invention, the water activation piece 4 of the above structure or the group of water activation pieces 4, 4, . . . are established in an internal space 26 of the water activation device 1. The water activation device 1 is configured by a conductive body 2 having an in-flow opening 24a and an out-flow opening 24b, a conductive coating body 23 which covers the outer surface of the conductive body 2 through insulating material 22. The conductive coating body 23 is insulated from a flow pipe 5.

The reference numerals in the parentheses in the claims and in the “Means to Solve the Problem” section are those in the accompanying drawings for better understanding of the structure of this invention, and are not limited to the particular aspect in these drawings.

Effect of the Invention

Since the water activation piece of the present invention has the above-mentioned structure, when it is established in the flow passage, the surface area where the water activation piece and the water flow are brought into contact with each other increases and the water activation piece itself axially rotates by the concaves or convexes or by the spiral grooves formed on the outer surface and (or) the inner surface of the through hole, thus, generating multiple swirls in the predetermined direction (rightward in plan view) of the flow passage. As a consequence, the water flow can increase the surface area as noted above where the water activation piece and water flow come in contact with one another and achieve an efficient water activation effect by the swirl. Especially, since the swirl generates electrons caused by the collision and friction between the water molecules and prompts the water activation effect, it contributes to an even more efficient water activation when the length of the flow passage is restricted.

Further, since one or more water activation pieces are held in the holder which causes the changes in the flow line of the water flow and such activation pieces are established in multiple stages, the area that generates the swirls is increased accordingly to increase the degree of water activation, where the water activation condition can be maintained over a long period of time.

The water activation device established with such a water activation piece or groups of water activation pieces is maintenance free and can achieve an efficient water activation effect in a restricted flow passage length unlike the conventional device, thereby enabling to remarkably contribute to the industry.

BEST MODE FOR IMPLEMENTING THE INVENTION

A specific example of the embodiment of the water activation device related to the present invention will be further explained with reference to the drawings. FIG. 1 is a perspective view of the water activation device in the present embodiment where a part of it is cut out, FIG. 2 is an axial cross sectional view of the water activation device in the present embodiment, FIG. 3 is a perspective view showing how the water activation device is assembled in the present embodiment, FIG. 4 is a perspective view of the water activation piece and a perspective view of the holder of the water activation device in the present embodiment where a part of it is cut out, and FIG. 5 is plan view showing the arranged condition of the water activation piece within the holder of the water activation device in the present embodiment.

First, the water activation piece and the structural arrangement of the water activation piece along with the water activation device consisting of these pieces and its structure in the present embodiment will be explained in detail below.

The water activation device 1 of the present embodiment, as shown in FIG. 1 and FIG. 2, is configured by arranging multiple stages of holders 3 for holding a plurality of water activation pieces 4 in the internal space of the body 2. The water activation device 1 is normally connected to

the flow pipe 5 such as a water pipe and established under the ground or is connected to a middle of the pipe in a house.

The body 2 is comprised of a main body 21 that is a metallic cylindrical pipe formed in a predetermined length, an insulation material 22 that is an electrically non-conductive material and covers the entire outer surface of the main body 21, and a conductive coating body 23 that coats the outer surface of the insulation material 22. Moreover, a connecting pipe 24 for serially connecting to the flow pipe 5 such as a water pipe is connected in a watertight manner at each end of the main body 21 in a manner to cover the openings thereof. As for the attachment of the connecting pipe 24 to the main body 21, an insulation ring 25 is intervened in a circular manner between the connecting pipe 24 and each end of the coating body 23 that faces the connecting pipe 24, thereby electrically insulating between the connecting pipe 24 and the coating body 23. Further, in an inner surface of the open end of the connecting pipe 24 attached to the main body 21, an internal screw 24c for connecting in a watertight manner to the flow pipe 5 is established. One side of this connecting pipe 24 is an in-flow opening 24a, and the other side is an out-flow opening 24b.

The body 2 is designed to reduce the pressure damage during the water flow by establishing the in-flow opening 24a and the out-flow opening 24b as mentioned above along the same straight line or same curved line. Further, the water activation device 1 does not require an earth connection if it is built under the ground, however, it is preferable for the coating body 23 to have an earth connection if the water activation device is established above the ground.

In a cylindrical internal space 26 of the body 2, the holder 3 mainly made through resin molding is fitted in an inner surface of the internal space 26. A plurality of holders 3 are arranged in multiple stages continuously on the same axis. The number of holders 3 arranged in this manner is properly selected based on the amount of water flow and the desired efficiency of the water activation.

The holder 3 in this embodiment comprises a disc-like retainer 31 formed with multiple flow openings 34 in a mesh-like manner, a connection column 32 of predetermined height that is vertically formed at the center of the retainer 31, a cylindrical side wall 33 formed with a taper with an outer opening on the top thereof that is lower than the connecting column 32 so that the outer edge of the other retainer 31 is enclosed by the tapered opening, and three belt-like retaining walls 31a formed on the inner side of the side wall 33 in an upright manner from the retainer 31, where above components are integrally formed.

The holder 3 is capable of holding one or more water activation pieces 4 in a predetermined arrangement by the retainer 31, the side wall 33, and the retaining wall 31a. In addition, a connection column opening 32a of predetermined diameter is formed on the top end of the connection column 32, where the other holders 3 arranged above and below the holder 3 is fitted on the same axis to allow connection of the holders 3 in multiple stages.

The in-flow opening 34 of the holder 3 is comprised of a plurality of revolving wing pieces 34a that radially extend from the connection column 32 and connect to the side wall 33, inner rings 34b that connect to the revolving wing pieces 34a in a circular direction and is sequentially arranged with the connecting column 32 in a concentric circle with a predetermined space, an inner wing piece 34c, and two outer wing pieces 34d. The dimension of the bottom side of the inner wing piece 34c and the outer wing pieces 34d is made slightly longer in height so that these pieces protrude downwardly from the side wall 33 and the revolving wing piece 34a.

An inclined surface where the water coming from above (arrow a) flows in a rightward rotation (clockwise, arrow d) manner in plan view is formed on the revolving wing piece 34a. Also, an inclined surface for deflecting the water in an inward direction (arrow e) is formed on the inner wing piece 34c, and an inclined surface for channeling the water in an outward direction (arrow f) is formed on the outer wing piece 34d. The inclined surface formed on each wing piece 34a, 34c, and

34d individually deflects the water flow in the rightward direction, inward direction, and outward direction with respect to the internal space of the body 2, hence, generating turbulence as a result.

The arrangement and number of the inner wing piece 34c and the outer wing piece 34d is not limited to that of the present embodiment, and can be properly changed, for example, all of them can be the inner wing pieces 34c or all of them can be the outer wing pieces 34d, or arrange the inner wing piece 34c at the outer peripheral or the outer wing piece 34d at the inner peripheral.

The retainer 31 of the holder 3 structured as described above holds one or more water activation pieces 4 in a predetermined arrangement. The water activation piece 4 is a cylindrical body where a burning body using multiple elemental minerals (such as ceramic and artificial tourmaline) as a main component and is formed with a through hole 42 including an axis 41. The height of the water activation piece 4 is slightly lower than the connection column 32 of the holder 3, where its diameter is about a half of the radius of the retainer 31 and the through hole 42 is formed slightly larger than the connection column 32.

Moreover, the outer surface and the inner surface of the water activation piece 4 form spiral grooves 43 that are concaved and convexed in a rightward rotation (clockwise) manner in plan view. By the spiral grooves 43, the surface area of the water activation piece 4 increases substantially, and the water flow coming from the above the water activation piece 4 (arrow a) becomes the rightward deflecting flow (arrow c). In the present embodiment, the spiral grooves 43 are formed in a continuous manner on the outer surface and inner surface, however, they can be formed in a non-continuous manner as well.

The water activation pieces 4 of the above-mentioned structure in the present embodiment are held in the arrangement where each holder 3, 3 . . . are arranged in multiple stages in the internal space 26 of the body 2 as described below. Namely, the connection column 32 of the holder 3 goes into the through hole 42 to fit one water activation piece 4, then, around this activation piece, several water activation pieces 4 (six in the present embodiment) are arranged inside of the retaining wall 31a in a manner that they will not contact with one another. Namely, one water activation piece 4 is arranged at the center, while several other water activation pieces 4, 4 . . . are arranged in a circular manner equally around the center water activation piece 4.

By the arrangement structure of the water activation piece 4, the surfaces of the water activation piece 4 fully contacts with the water flow, where the water activation piece 4 itself axially rotates in the rightward (clockwise, arrow b) direction by the spiral grooves 43.

Effects

The water activation device 1 using the water activation piece 4 and the arrangement structure thereof achieve the following effects.

First, the incoming water from the in-flow opening 24a of the body 2 reaches the retainer 31 while bumping into the water activation pieces 4 held in the retainer 31 of the holder 3 and passing therethrough. At this time, each water activation piece 4 axially rotates in the rightward direction (arrow b) at its arranged location so that the incoming water becomes a rightward (arrow c) deflected flow because it is arranged that the water activation pieces 4 will not contact with each other and the spiral grooves 43 are formed on the outer surface and the inner surface.

Next, the incoming water that has reached the retainer 31 by the rightward deflected flow basically generates a plurality of rightward swirls, namely, diverse turbulences, when passing through the in-flow opening 34, by the revolving wing piece 34a, inner wing piece 34c, and outer wing piece 34d which add the deflection of the rightward flow (arrow d), the inward deflected flow (arrow e), and the outward deflected flow (arrow f) to the rightward deflected flow.

The incoming water in such a turbulent state flows out (arrow g) from the out-flow opening 24b where the same effects mentioned above are added thereto every time it passes through each holder 3 arranged in the multiple stages in the internal space 26 of the body 2.

This outgoing water becomes reduced by subdivision of hydrogen bond groups (cluster) of the water molecules caused by infrared rays of the water activation piece 4 and by receiving electrons generated by the friction between the water molecules, in other words, it becomes activated. The degree of the activation is high because of the diverse turbulence where several rightward swirls are deflected inward and outward, namely, it generates an efficient stirring effect, which immediately amplifies an electrical charge to raise the state of activation by the structure of the water activation pieces 4 and the holder 3 that holds these pieces.

In addition to the above-mentioned effect, by fitting the outer shape (outer edge) of the holder 3 into the inner surface of the internal space 26 of the body 2, all of the incoming water passes through the in-flow opening 34 established on the retainer 31 of the holder 3 and bumps into the water activation pieces 4, thereby amplifying the activation effect. The degree of activation can be properly adjusted by increasing or decreasing the number of holders 3 arranged in the multiple stages.

Further, by establishing the electrical insulation between the internal space 26 of the body 2 and the coating body 23, the water activation device 1 will function as an electrical double layer capacitor, which prevents the deterioration of the activation effect caused by the action that the electrons generated in the internal space attract positive charges from the outside of the body 2, and which is also effective in preventing corrosion on the water activation device 1.

FEASIBILITY OF OTHER EMBODIMENTS

The water activation piece 4 of the above-mentioned embodiment is formed with convex and concave spiral grooves 43 on the inner surface and outer surface thereof, however, these spiral grooves 43 can be combined with independent fins (wings).

Also, the water activation piece 4 is a cylindrical body formed with the through hole 42 on the axis for axially rotating the piece itself, however, a plurality of through holes 42 can be formed for one water activation piece 4 (for example, form several through holes in an artificial coal manner).

Further, the number of the water activation pieces 4 incorporated in the holder 3 can be freely increased or decreased so long as it can prevent from contacting one another, and can change the arrangement of the water activation pieces for each of the holders 3 that are established in the multiple stages.

In addition to the above, in the present embodiment, the water activation device 1 is structured so that the flow pipe 5 and body 2 are connected on the same axis, however, it is not limited to this embodiment, and for example, it can be structured where an in-flow opening and an out-flow opening for treated water are established on a cylindrical, calyx-like, or rectangular storage tank that is watertight and in proper condition that has a smooth inner side for passing the water and established with several holders along the flow line (not shown).

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a partially cut-out perspective view showing the water activation device in the present embodiment.

FIG. 2 is an axial cross sectional view of the water activation device in the present

embodiment.

FIG. 3 is an exploded perspective view of the water activation device in the present embodiment.

FIG. 4 is a partially cut-out perspective view of the water activation piece and the holder of the water activation device in the present embodiment.

FIG. 5 is a plan view showing the arrangement of the water activation piece within the holder of the water activation device in the present embodiment.

Fig. 1

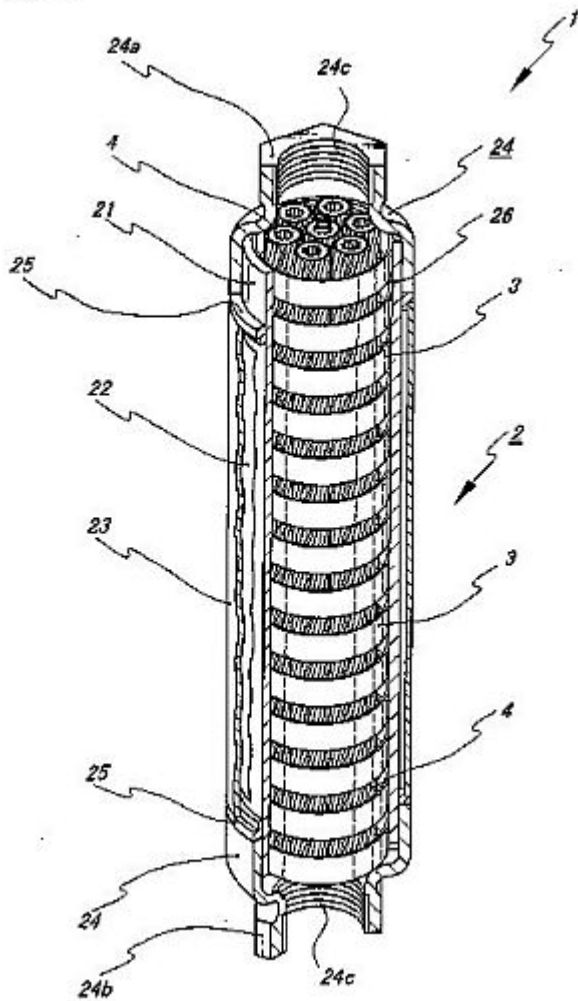


Fig. 2

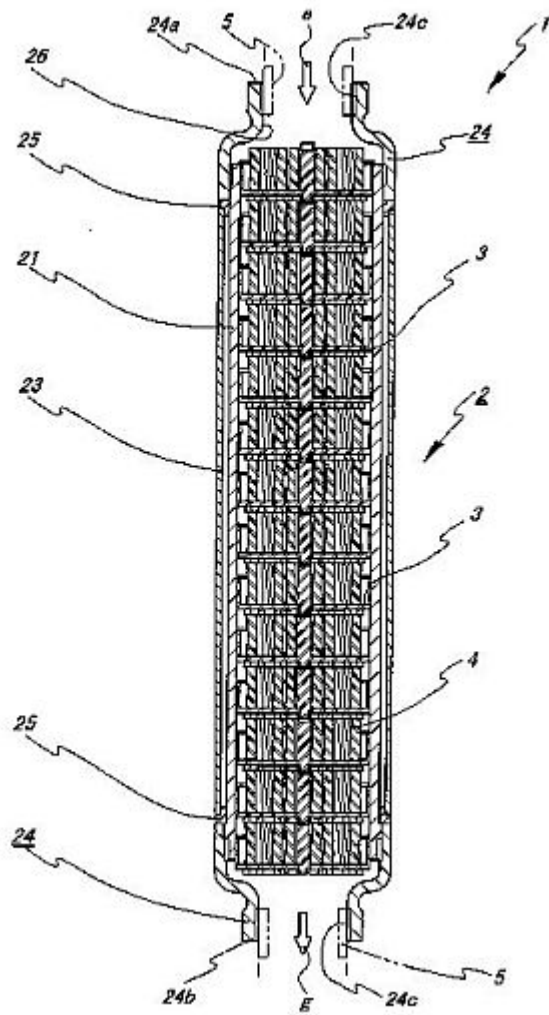


Fig. 3

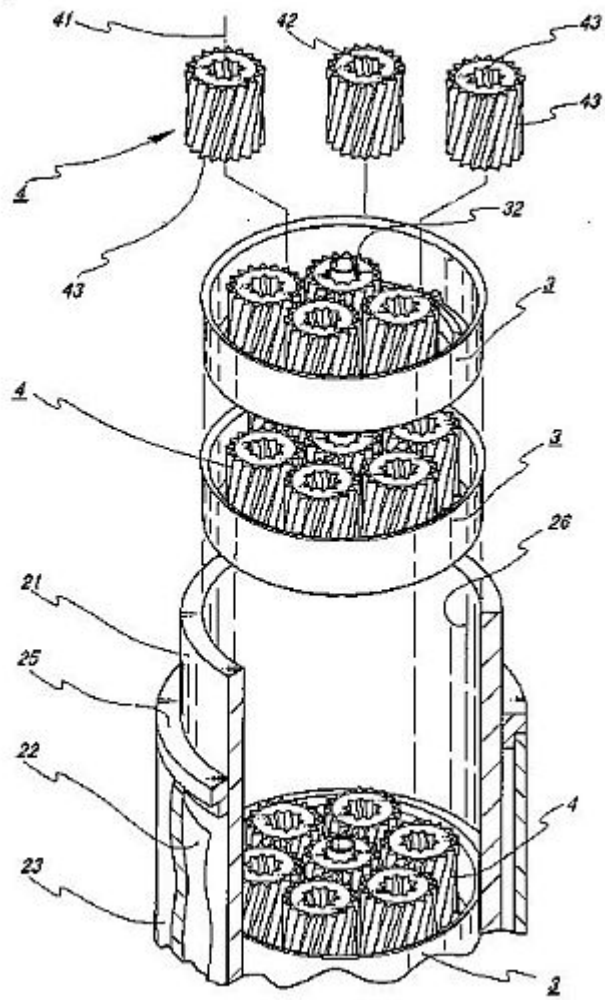


Fig. 4

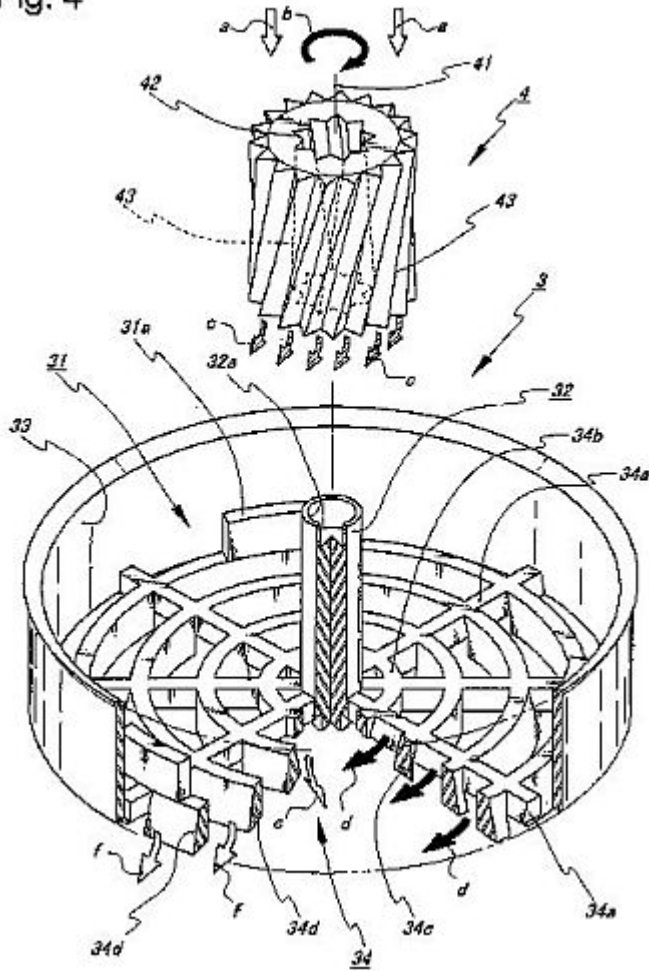
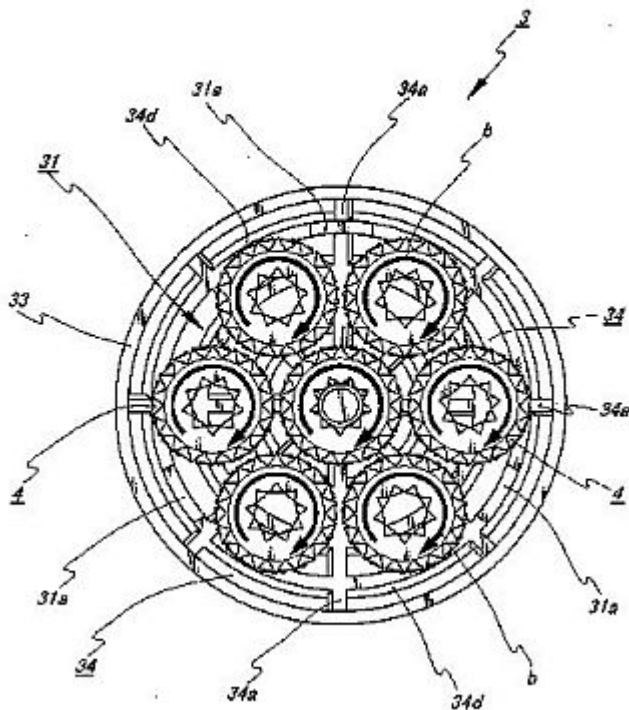


Fig. 5



DESCRIPTION OF REFERENCE NUMERALS

- 1 Water activation device
- 2 Body
- 21 Main body
- 22 Insulation material
- 23 Coating body
- 24 Connecting pipe
- 24a In-flow opening
- 24b Out-flow opening
- 24c Internal screw
- 25 Insulation ring
- 26 Internal space
- 3 Holder
- 31 Retainer
- 31a Retaining wall
- 32 Connection column
- 33 Side wall
- 34 In-flow opening
- 34a Revolving wing piece
- 34b Inner ring
- 34c Inner wing piece
- 34d Outer wing piece
- 4 Water activation piece
- 41 Axis
- 42 Through hole
- 43 Spiral groove
- 5 Flow pipe

Water activation device US7094342

FIELD OF THE INVENTION

This invention relates to a water activation device for activating water by directly connecting to water pipes.

BACKGROUND OF THE INVENTION

In the natural world, rain and snow accumulated in the mountains permeate the ground and become groundwater. After a while, the groundwater becomes spring water and forms the headstream of a river. During this process, the water becomes reduced either by the subdivision of the hydrogen bond group (cluster) of water molecules caused by infrared rays, negative ion actions, or magnetic actions of minerals and rocks, or by receiving the electrons generated by the friction between water molecules created from collision against the rocks or waterfall. The water in such condition is called activated water, and various effects of the activated condition are gradually lost since the activated condition cannot be maintained for a long period of time.

Therefore, a water activation device has been developed by applying the principle of this activation process, where the water losing its activation effect is reactivated by water flow friction which is caused by flowing and stirring the city water through ceramic baked particles placed in the internal space.

However, the limited length of the water passage in the conventional activation process gives rise to problems such as insufficiency in activation effect and fails in subdividing the water molecules and lowering a voltage of oxidation-reduction. Also, in the activation device having a structure that the ceramic baking particles are mixed together and collide against each other by the water flow, the water flow often becomes sluggish because the particles are unevenly distributed, which results in losing the water pressure. Moreover, the wearing-out of the ceramic baking particles over a long period of time reduces the amount of the ceramic baking particles and causes problems such as losing the activation effect and requiring maintenance works for replacing the ceramic baking particles.

As described in the foregoing, there is a need for a water activation device that can overcome the drawbacks of the conventional technology.

SUMMARY OF THE INVENTION

It is, therefore, an object of the present invention to provide a water activation device that can efficiently activates the water that has lost the activation effect and maintain its activation effect over a long period of time.

It is another object of the present invention to provide a structure of water activation device which is capable of easily replacing the activation materials.

In order to achieve the above object, in the first aspect of the present invention, the water activation device is comprised of: a body which is made of conductive material and has an in-flow opening and an out-flow opening; a cover member which is made of conductive material and covers an outer surface of the body through insulation material therebetween and is insulated from water pipes; a plurality of holders overlapped with one another in an axial direction of the body, each of the holders being formed of a retainer having a plurality of flow openings; and a plurality of activation material units each being formed in a cylindrical lump containing minerals as a main component. The plural activation material units are placed in an overlapping manner without contacting with one another along a direction of a water flow in an internal space of the body.

In the second aspect of the water activation device of the present invention, one or more of the activation material units are removably held in a holder without contacting with one another, and wherein one or more of the holders are removably provided in the body.

In the third aspect of the water activation device of the present invention, the in-flow opening and the out-flow opening are formed in a pipe-like manner along a straight or curved center line of the body.

In the fourth aspect of the water activation device of the present invention, a plurality of flow openings are formed on a retainer of the holder that holds the activation material units, and wherein an outer perimeter of the retainer is substantially fitted with an inner surface of the internal space of the body.

In the fifth aspect of the water activation device of the present invention, the plurality of holders are placed and connected with each other in an overlapping manner along a straight and curved center line of the body.

In the sixth aspect of the water activation device of the present invention, the plurality of flow openings formed on the retainer of the holder are comprised of: turning slope surfaces for generating deflected flows of water in a turning direction; inner slope surfaces for generating deflected flows of water in an inner radial direction; and outer slope surfaces for generating

deflected flows of water in an outer radial direction.

The water activation device of the present invention based on the above structure is applied as follows. First, the water coming from the in-flow opening impinges on the activation material units held by the retainer of the holder, passes through the activation material units, and reaches the retainer. The activation material units or the holders will not be worn out because the activation material units are placed so as not to contact with one another, and are firmly held on the retainers with the pressure of the water flow. As a result, the ability of subdividing the hydrogen bond groups (clusters) of water molecules based on infrared rays from activation material units can be maintained in the internal space of the body over a long period of time. Furthermore, since the electrical insulation between the internal space of the body and the cover member functions as an electric double layer capacitor, the electrons generated in the internal space will not attract any positive charge from the outside of the body, thus, suppressing any damage in the activation process and preventing any electric corrosion on the water activation device.

Based on the water flowing to the water activation device, the hydrogen bond groups (clusters) of water molecules are subdivided by the infrared rays from the activation materials, and the electrons are generated from the friction of the water molecules to create reduced water within the internal space of the body. In other words, the water flows out from the out-flow opening has been converted to activated water. Also, by adjusting the number of holders that are placed in multiple layers, the degree of activation can be adjusted. Further, by placing the in-flow opening and out-flow opening along the same straight or curved line, pressure loss during the water flow can be prevented.

In addition, by fitting the outer perimeter (outer rim) of the holder into the inner surface of the internal space, all of the flowing water will pass through the flow openings established on the retainer of the holder and collide against the activation material units, thereby amplifying the activation process. Moreover, when the water flows through the turning slope surfaces, inner slope surfaces, and outer slope surfaces established on the retainer, turbulent flows are generated from the turning flows, inner deflected flows, and outer deflected flows, exerting stirring effects as well as amplifying a charge generation activity.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view including a partial cross section of an example of a water activation device of the present invention.

FIG. 2 is a cross sectional view of the water activation device of the present invention.

FIG. 3 shows an outside view of the holder used in the water activation device of in the present invention including a partial cross sectional view.

FIG. 4 is a plan view of the holder used in the water activation device of the present invention.

Fig. 1

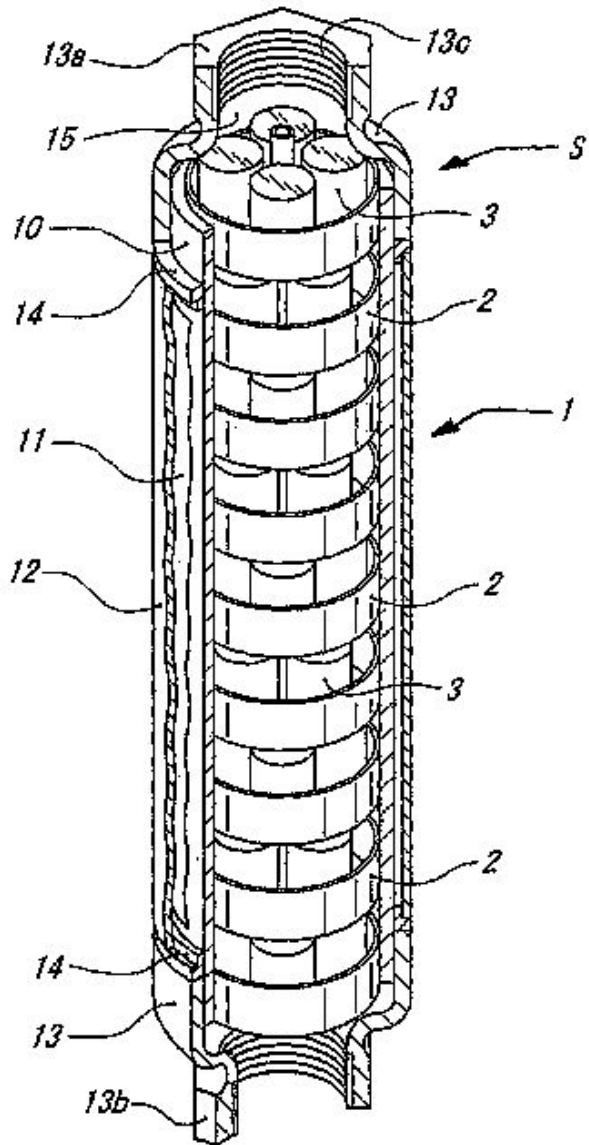


Fig. 2

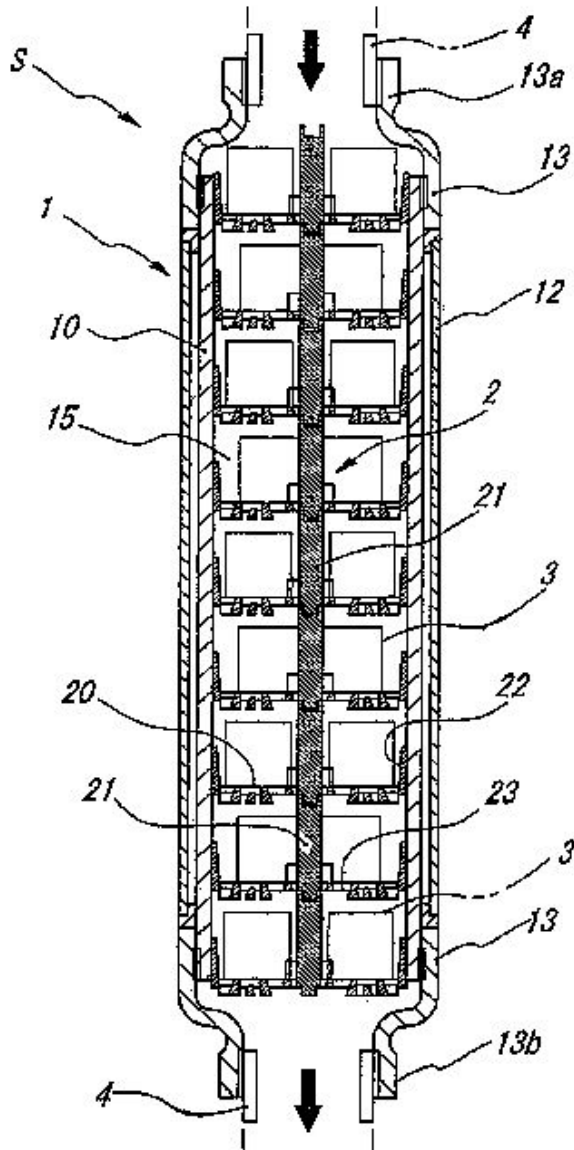


Fig. 3

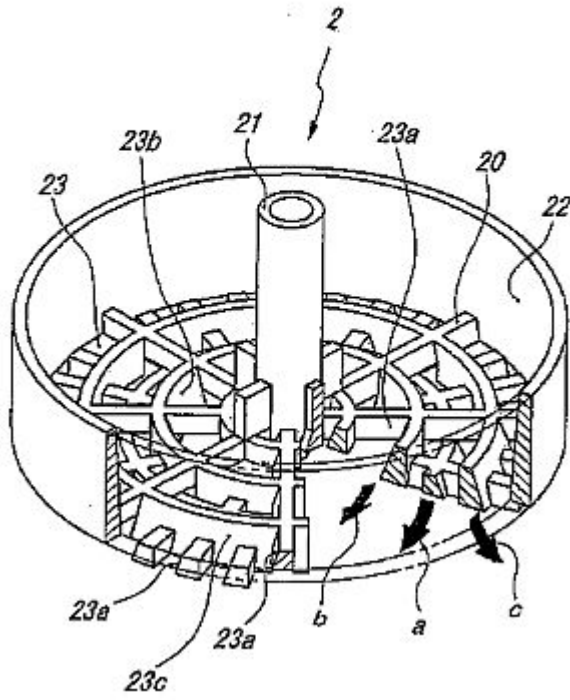


Fig. 4

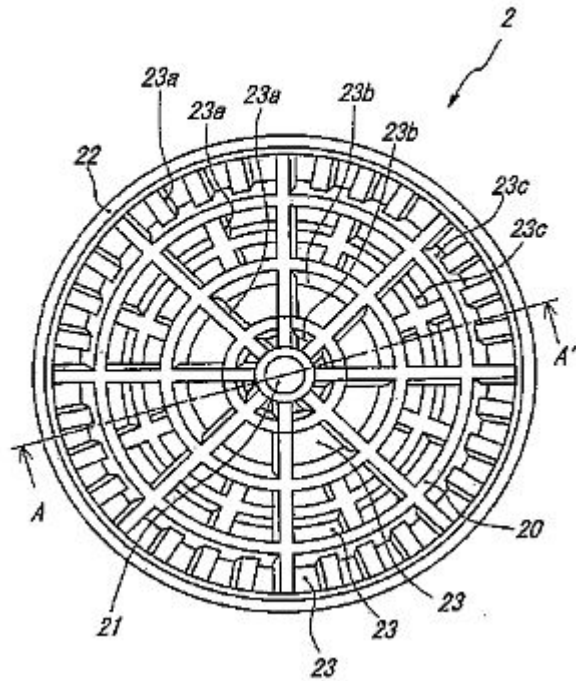


Fig. 5

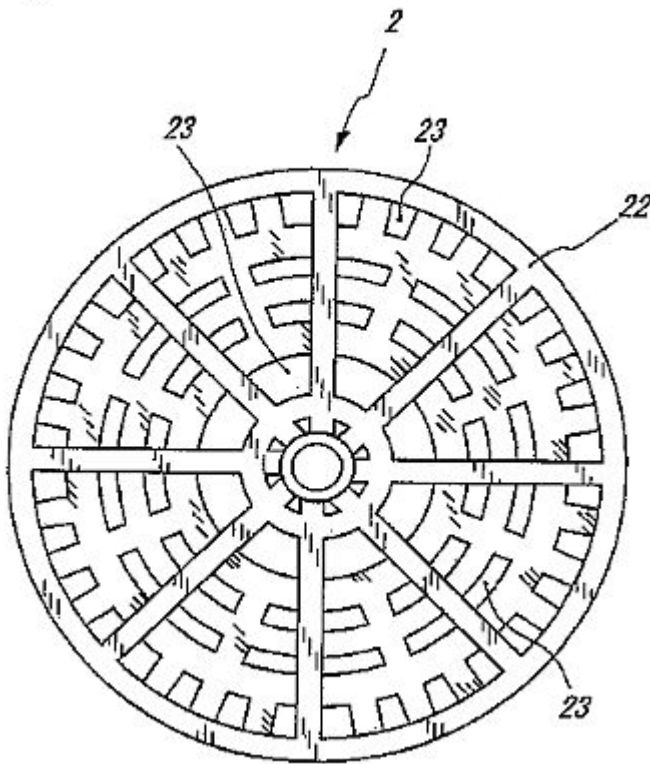


Fig. 6

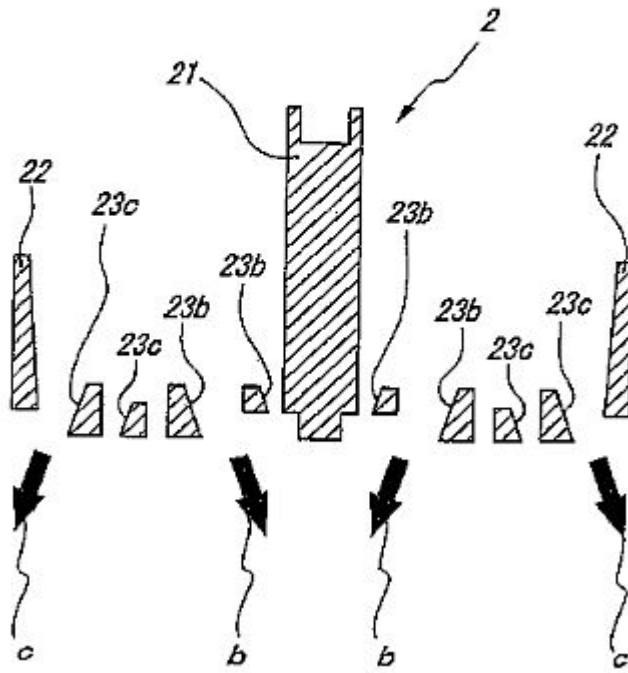


Fig. 7

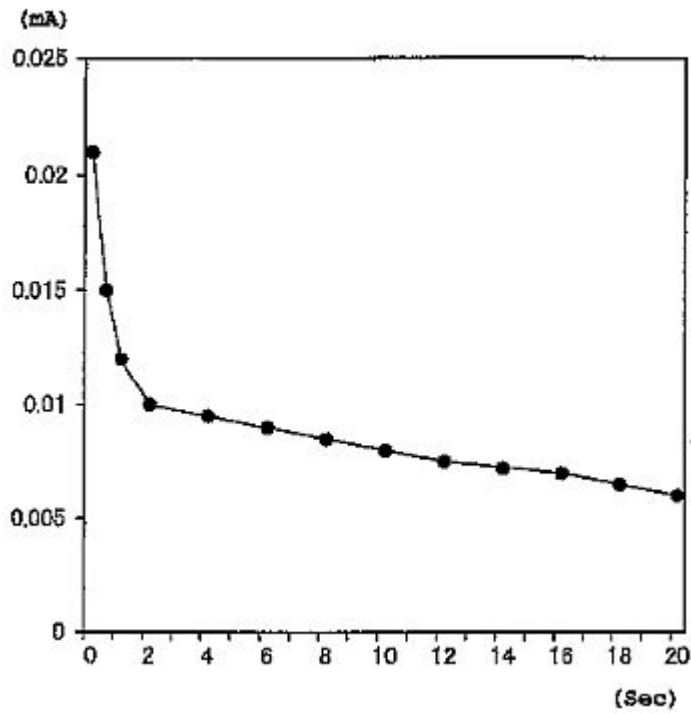


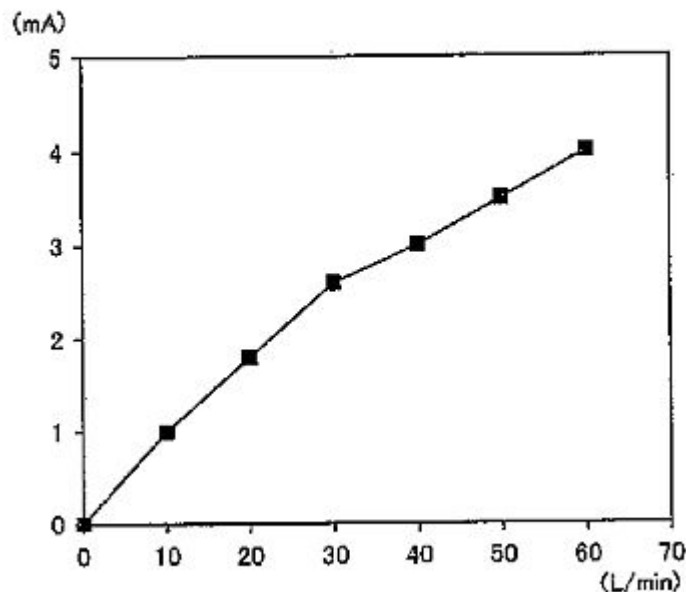
Fig. 8

FIG. 5 is a bottom view of the holder used in the water activation device of the present invention.

FIG. 6 is a cross sectional view of the holder used in the water activation device of the present invention taken along the A-A line of FIG. 4.

FIG. 7 is a graph showing the measurement result of the discharge characteristics of the water activation device of the present invention.

FIG. 8 is a graph showing the measurement result of the electric charge characteristics relative to the amount of water flowing through the water activation device of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

Preferred embodiments of the present invention will be described with reference to the accompanying drawings. FIG. 1 is a perspective view including a partial cross section of an example of a water activation device of the present invention, FIG. 2 is a cross sectional view of the water activation device, FIG. 3 shows an outside view of the holder used in the water activation device including a partial cross sectional view, FIG. 4 is a plan view of the holder used in the water activation device of the present invention, FIG. 5 is a bottom view of the holder, FIG. 6 is a cross sectional view of the holder taken along the A-A line of FIG. 4.

The water activation device S is mainly comprised of a body 1, holders 2, and activation material unit 3. The body 1 is composed of a main body 10 having a cylindrical metal tube of a predetermined length, insulation material 11 which is electrical insulation material and covers almost all of the outer surface of the main body 10, and a conductive cover member 12 having a tubular shape which covers the insulation material 11 on the main body 10. Further, connecting tubes 13 for serially connecting to a water flow passage are spirally connected to both ends of the main body 10 in a watertight manner to cover the openings.

In assembling the connecting tubes 13, electrical insulation rings 14 (FIG. 1) are provided between the ends of the cover member 12 and the connecting tubes 13, thereby electrically insulating therebetween. Inner screws 13c for screw connecting to water pipes 4 (FIG. 2) in a watertight manner are provided on an inner surface at open ends of the connecting tubes 13 attached to the main body. One of the connecting tubes 13 works as an in-flow opening 13a and the other works as an out-flow opening 13b.

One or more holders 2 made through resin molding processes are provided in a cylindrical internal space 15 of the body 1 as shown in FIGS. 1 and 2. The holder 2 is integrally formed of a disc-like retainer 20 having multiple flow openings 23 shaped in a net-like manner, a connecting column 21 that is vertically installed in the center of the retainer 20 and has a predetermined height, and a cylindrical side wall 22 that is shorter than the height of the connecting column 21 and surrounds an outer edge of the retainer 20, as shown in FIGS. 3 and 4.

In the retainer 20 of the holder 2 structured as mentioned above, one or more activation material units 3 explained hereafter are placed around the connecting column 21. Further, the plurality of such holders 2 are coaxially placed along the internal space 15 of the body 1 so that each connecting column 21 is joined in a coaxial manner. The activation material units 3 are preferably placed over the retainer 20 without contacting with one another so that the water will evenly flow over the surfaces of the activation material units 3. Further, the activation material units 3 located between adjoining holders (ex. upper holder and lower holder) 2 are preferably placed such that two positions on the adjoining holders 2 with respect to a center of the column 21 should have a proper angle each other. In this example, the activation material units 3 provided on the holders 2 are separated by 90[deg.] from one another with respect to the column 21. The activation material units 3 in the upper or lower holder 2 are positioned by 45[deg.] different from those of the center holder 2, which is a half of the spacing angle (90[deg.]) between the activation materials on the same holder 2.

Moreover, various slope surfaces are formed in the flow openings 23 of the holder 2 as shown in FIGS. 3-6. In order to generate turbulent flows by the deflection of the water flowing through the retainer 20, in the flow openings 23, a plurality of slope surfaces 23a which are radially formed are tilted (at the side of the out-flow opening 13b) towards the turning direction. In addition, at the side of the out-flow opening 13b, a plurality of inner slope surfaces 23b near the inner side of the flow opening 23 are tilted towards an inner direction, and a plurality of outer slope surfaces 23c near the outer side of the flow opening 23 are tilted towards an outer direction in a concentric circle-like manner.

The activation material unit 3 held by the holder 2 as described above is a cylindrical pellet-like baked member containing multi-element minerals as a main component. The activation material unit 3 in this example is approximately as tall as the connecting column 21 (FIGS. 1 and 2), and has a diameter of about half that of the holder 2. Each bottom part of the activation material unit 3 is attached to the retainer 20 of the holder 2 such that the four activation material units 3 are respectively placed by 90[deg.] apart from the other.

In this example, ground (earth) connection is not necessary since the water activation device S is buried underground. However, if the water activation device S is installed above the ground, the cover member 12 should be preferably grounded.

Operations in the water activation device S of the present invention based on the above structure are as follows. First, the water coming from the in-flow opening 13a impinges on the activation material units 3 held by the retainer 20 of the holder 2, passes through the activation material units 3, and reaches the retainer 20. The activation material units 3 or the adjoining holders 2 will not be worn out from the contact because the activation material units 3 are placed so that they do not contact with one another, and are firmly held on the retainers 20 with the pressure of the water flow. As a

result, the ability of subdividing the hydrogen bond groups (clusters) of water molecules based on infrared rays from activation material units 3 can be maintained in the internal space 15 of the body 1 over a long period of time.

Moreover, various turbulent flows such as the turning flow a, the inner deflected flow b, and the outer deflected flow c are generated such as shown in FIGS. 3 and 6 when the water flows through the turning slope surfaces 23a, inner slope surfaces 23b, and outer slope surfaces 23c provided on the retainer 20, where the friction and collision of the water molecules generate electrons to create reduced water, which flows out as activated water from the out-flow opening 13b (FIGS. 1 and 2).

The function of an electric double layer capacitor formed by the body 1 and the cover member 12 was evaluated. The measured value of internal resistance between the body 1 and cover member 12 is 600k[Ω]. When charging it by a DC (Direct Current) voltage source of 15 volts for three seconds, a voltage of 0.03 V and a current of 0.02 mA between the body 1 and the cover member 12 were observed. As shown in the measurement result of the discharge characteristics of FIG. 7, it is known that the electrical insulation between the internal space 15 of the body 1 and the cover member 12 functions as an electric double layer capacitor. Consequently, the electrons generated in the internal space 15 will not attract positive charges from the outside of the body 1, thus not adversely affect the activation process. This is also effective in preventing the electrical corrosion on the water activation device S.

FIG. 8 shows a measurement result of the electric charge characteristics relative to the amount of water flowing through the water activation device S. It should be noted that a large amount of electric charge is generated within the amount of ordinary city water. The number of the holders 2 as well as the size and shape of the activation material units 3 can be modified because the length of the internal space 15 of the water activation device S is also optional. Further, the positions and the number of the activation material units 3 per every holder 2 can be appropriately changed.

Further, in the above embodiment, the water pipe 4 and body 1 are coaxially connected. However, the water activation device of the present invention is not limited to such a particular configuration. For example, although not shown, a storage tank with a properly watertight form such as a cylinder, calyx, or rectangular box can be established with an in-flow opening and an out-flow opening to connect the water activation device of the present invention so that the water to be treated can flow through. The inside of the storage tank can be smoothly structured and several holders can be placed in a stream line manner.

As has been described, according to the water activation device of the present invention, the hydrogen bond groups (clusters) of water molecules can be subdivided by infrared rays coming from the activation material held in the holder of the internal space of the body. Further, the water can be efficiently activated, resulting in remarkable effects since reduced water is produced by the electrons which are generated from the friction and collision of the water molecules caused by various turbulent flows created by the water flowing through the retainer of the holder.

Although the invention is described herein with reference to the preferred embodiments, one skilled in the art will readily appreciate that various modifications and variations may be made without departing from the spirit and the scope of the present invention. Such modifications and variations are considered to be within the purview and scope of the appended claims and their equivalents.

WATER ACTIVATING MODULE...
WO2008044264

[PROBLEMS] To provided a water activating module for realizing a water activating apparatus that

despite simple structure, produces a state of agitation of water stream and that can cope with an enhancement or alteration of water activating capability at the site of installation; and provide a water activating module tube composed of an assembly thereof and a water activating apparatus utilizing these. [MEANS FOR SOLVING PROBLEMS] A water activating module is fabricated by mixing a mineral exhibiting water activating capability into a resin base material, molding the mixture into a shell form and providing its side face with a convex column and an opening passing through the side face. This water activating module has the configuration of one split piece obtained by splitting a tubular body along a bus line into multiple pieces. A water activating module tube is fabricated by joining multiple water activating modules at mutually fittable split end faces to each other into a tubular form. A water activating apparatus is fabricated by arranging in a conduit line the water activating module tube fabricated by joining water activating modules of the above configuration to each other. The water activating module tube is disposed in approximately coaxially in the conduit line with a given spacing between the outer circumferential side thereof and the internal face wall of the conduit line.

WATER ACTIVATION APPARATUS WO2007072590

Field of the Invention

[0001] The present invention relates to the field of water activation apparatuses to be installed in waterworks for activation of tap water and, in particular, to a water activation apparatus having a structure that cannot limit the installation site thereof with no reduction in the ability to produce activated water.

Background of the Invention

[0002] Rainfall and/or snowfall in mountain areas seep underground to become groundwater and, in due course, to become spring water to form headwaters. In this process, the water becomes reduced, that is, activated by being subjected to the action of far-infrared, negative ions, and/or magnetism by minerals and rocks so that hydrogen-bonded clusters in water molecules are segmentalized or by receiving negative ions (electrons) due to friction between water molecules such as collisions against rocks and falling from waterfalls.

[0003] However, such an activated state of water is not maintained for a very long time, resulting in gradual loss of various effects of activated water. For this reason, there have conventionally been put into practical use apparatuses (hereinafter referred to as "water activation apparatuses") that apply the principle of the water activation effect above to reactivate tap water that has lost its activation effect by arranging ball-shaped fired ceramic particles (hereinafter referred to as "ceramic balls") or generating a magnetic field in the internal space of the apparatus and by passing and agitating water through the space to achieve water-flow-induced friction.

[0004] For example, there is disclosed a water activation apparatus in which multiple cases each having ceramic balls therein and formed with a water passage hole are housed in a cylindrical chassis that can be interposed into a tap water passage pipe (refer to Patent Document 1, for example).

[0005] In addition, there is also disclosed a water activation apparatus in which a group of approximate far-infrared radiation ceramic boards each formed with passage pores are arranged rotatably and in a multilayer manner in a chassis that can be interposed into a tap water passage pipe or the like, as is the case with the invention of Patent Document 1, and in which the ceramic boards are rotated by collision blades formed thereon (refer to Patent Document 2, for example).

Patent Document 1: Japanese Laid-Open Patent Publication No. 2001-058191 (pages 3 to 5 and Fig.1)

Patent Document 2: Japanese Laid-Open Patent Publication No. 2000-107752 (pages 2 to 3 and Fig.1)

Disclosure of the Invention

Problems to be solved by the Invention

[0006] However, the water activation apparatuses described in the foregoing patent documents must adopt a chassis composed of a hard material such as metal having a certain length for structural reasons such as water activation and maintaining such an activated state of water for long periods of time. Therefore, an appropriate amount of space is required to install such an apparatus, resulting in limiting the installation site thereof. That is, conventional water activation apparatuses include an inflexible chassis and thereby have no flexibility in securing an installation space, whereby at sites with limited space such as existing bathrooms including a toilet and a shower, not only is it difficult to install quickly, but also large-scale installation works may be required or the installation itself may have to be abandoned when it cannot be obtained.

[0007] Also, with certain existing apparatuses that use activated water, such as bathrooms with a shower and a washing machine, it may be preferable to increase the temperature of the activated water. From the perspective of space securement, however, it is very difficult to install not only a water activation apparatus but also a heating apparatus in a pipe conduit to such existing apparatuses or in an internal reservoir tank.

[0008] Hence, the present invention has been made to solve the above-described problems, and an object thereof is to provide a water activation apparatus having a limited flow path length yet with an efficient water activation effect of segmentalizing hydrogen-bonded clusters in water molecules and a heating effect as well as having a structure quickly and easily installable also in existing water supply facilities.

Means for Solving the Problems

[0009] In order to solve the above-described problems, the present invention is directed to a water activation apparatus arranged as follows. That is, the water activation apparatus includes: a flexible pipe body (2) with at least the inner pipe wall (21) thereof being electrically isolated; and multiple water activation pieces (3) arranged in series within and along the pipe body, the water activation pieces each being composed mainly of a mineral and molded into a contour shape loosely fittable inside the pipe body. Loosely fittable inside the pipe body means in other words that the outer peripheral surface of each water activation piece (3) approximately fitted inside the pipe is separated from the inner pipe wall (21) of the pipe body with a predetermined gap.

[0010] The water activation pieces (3) may each be arranged in such a manner as to have a columnar shape with a predetermined length and that the outer peripheral surface thereof is formed with one or more discontinuous or continuous rifling patterns (33) for turning water flow. Also, the water activation pieces (3) may each be arranged in such a manner as to have a water passage port (32) formed in a penetrating manner in a water passage direction. Further, the water activation pieces (3) may each be arranged in such a manner that the inner peripheral surface of the water passage port (32) is formed with one or more discontinuous or continuous rifling patterns (33) for turning water flow. With these additional arrangements, more efficient effects of the present invention can be expected.

[0011] Next, in view of contact or collision between multiple water activation pieces arranged in

series, buffer means (4) may be provided integrally or separately at each portion where adjacent water activation pieces (3) are in contact with each other. In the case of arranging the buffer means, buffer materials may be provided integrally with each water activation piece (3) at the contact portions (both end portions if in a columnar shape) of the water activation piece (3). Alternatively, a spacer (4) composed of a member having a buffering feature (e.g. elastic member) may be arranged as buffer means (4) separately from each water activation piece (3). Such a spacer (4) may be interposed for every multiple water activation piece depending on the degree of buffering required, though it is preferable to arrange for every one water activation piece.

[0012] Specific examples of such a spacer (4) include: an approximately disk-shaped one formed with an opening (41) and a slit (42) for permitting water passage therethrough; and multiple cut pieces or ball-shaped ones arranged in such a manner as to come into contact with each water activation piece (3) and not to block water passage.

Thus installing buffer means (or buffer members) allows the water activation pieces (3) to be moved smoothly when the pipe body (2) is bent, and can also absorb impact to the water activation pieces (3) due to a water hammer phenomenon as well as prevent the water activation pieces (3) from being damaged and/or abraded by continuous or intermittent contact therebetween.

[0013] It is more preferable that the water activation pieces (3) are each arranged in such a manner as to have a columnar shape with a predetermined length and that the outer peripheral surface thereof is formed with one or more continuous rifling patterns (33) for turning water flow when the axis (31) of the columnar body is positioned parallel to the water flow. In addition, the rifling patterns (33) are formed clockwise when viewed from the upstream side.

[0014] In addition to the arrangement above, the water activation pieces (3) are each arranged in such a manner as to have a water passage port (32) including the axis (31) bored in the columnar body and that the inner peripheral surface of the water passage port (32) is formed with one or more discontinuous or continuous rifling patterns (33) for turning water flow when the axis (31) of the columnar body is positioned parallel to the water flow. The rifling patterns (33) are also preferably formed clockwise in the water passage port (32), as is the case with the rifling patterns (33) on the outer peripheral surface.

[0015] The outer pipe wall (24) of the flexible pipe body (2) may be applied with a coating compound (24a) composed of one or more materials selected from graphite and minerals. The coating compound (24a) is used to emit growth light, part of far-infrared radiation, circumferentially through graphite and/or minerals as main raw materials, having a function of converting vibration energy of flowing water, which is rotated and turned through the water activation pieces (3) within the pipe body (2), into thermal energy.

[0016] In addition to the application of the coating compound (24a), the entire pipe body (2) may further be covered with a flexible tube (6) containing the same materials as the coating compound (24a) for emitting growth light. Thus being covered with the flexible tube (6) allows the conversion efficiency from vibration energy of flowing water passing through the pipe body (2) into thermal energy to be further improved.

[0017] The thus arranged water activation apparatus (1) according to the present invention includes electricity removing means (5) arranged in the pipe body (2). The electricity removing means (5) is preferably arranged at the terminal part on the downstream side of the water activation apparatus (1).

[0018] The electricity removing means (5) includes: a conductive chassis (51) having an inflow port (54a) and an outflow port (55a); a conductive covering body (53) including an insulation material (52) for covering the outer periphery of the chassis (51) and electrically isolated from a water

passage pipe (7); and water activation pieces (3) each composed mainly of a mineral, in which the multiple water activation pieces (3) are arranged in series without being in contact with each other along the water passage direction of the chassis (51).

[0019] In addition, water activation pieces (3) arranged within the electricity removing means (5) have the same form as that of water activation pieces (3) arranged within the pipe body.-->

[0020] Also, the reference numerals in parentheses used in the Claims and the foregoing Means for Solving the Problems are added as reference based on the reference numerals in the accompanying drawings to facilitate understanding of the arrangements of the invention, and it is a matter of course that the arrangements of the invention should not be limited to the configurations in the drawings.

Effects of the Invention

[0021] In the water activation apparatus according to the present invention, the pipe body has flexibility, that is, a feature bendable to a predetermined curvature by, for example, being formed into a so-called accordion-like shape and/or composed of an elastic material, which offers greater flexibility in pipe conduit design, though pipes often have their respective complex configurations at every installation site, as well as exhibiting an effect of allowing for flexible and impromptu handling for each field site. It is therefore possible to install such an apparatus quickly with no large-scale installation work even at installation sites where quick installation has conventionally been difficult.

[0022] Also, as for the water activation pieces arranged inside the water activation apparatus, the rifling patterns formed on the outer peripheral surface and (or) the inner peripheral surface of the water passage port cause the surface area with which flowing water comes into contact to be increased as well as the flowing water to be turned, resulting in a clockwise vortex flow when viewed from the upstream side in the present invention. Consequently, the flowing water can be in contact with the water activation pieces through an increased contact surface area and activated efficiently under the vortex flow state. In particular, vortex flow promotes water activation induced by negative ionization due to collision and friction between water molecules, which can achieve efficient water activation even if the flow path length may be limited and/or the entire flow path may be bent.

[0023] Further, in the water activation apparatus, the outer pipe wall of the pipe body may be applied with a coating compound composed mainly of graphite and/or minerals or may be covered with a flexible tube containing graphite and/or minerals. The coating compound and the flexible tube have an effect of emitting growth light, part of far-infrared radiation, circumferentially, converting vibration energy of flowing water, which is in a vortex flow state within the pipe body, efficiently into thermal energy, and heating the flowing water. This heating effect allows for flexible installation also into existing apparatuses that require heating of water, such as bathrooms with a shower and a washing machine, with no additional heating device, whereby flowing water can be activated as well as heated. In particular, apparatuses including a circulation type reservoir tank can achieve an improved heating effect because flowing water passes through the pipe body multiple times.

[0024] In addition, the water activation apparatus includes electricity removing means. The electricity removing means is adopted to ground and remove positive ions in flowing water that are ionized through contact with the water activation pieces. Thus installing the electricity removing means promotes negative ionization of flowing water passing through the water activation apparatus and thereby lowers its redox potential accordingly, exhibiting an effect of achieving more efficient water activation.

Best Mode for Carrying Out the Invention

[0025] Specific embodiments of a water activation apparatus 1 (hereinafter referred to as "present apparatus") according to the present invention will hereinafter be described in detail with reference to the accompanying drawings. Fig.1 is a perspective view of the present apparatus partially cut away; Fig.2 is a vertical cross-sectional view of the present apparatus; Fig. 3 is an assembled perspective view of the present apparatus; Fig.4 is a perspective view of the present apparatus partially cut away; and Fig.5 is a perspective view of electricity removing means in the present apparatus partially cut away.

[0026] As shown in Figs.1 and 2, the present apparatus 1 has an arrangement that multiple water activation pieces 3 are arranged in series in the internal space 23 of and along the pipe body 2. Also, a spacer 4 as buffer means is arranged in an interposed manner for every one water activation piece 3.

[0027] The present apparatus 1 is normally to be installed in the middle of pipe conduits at sites with limited space to have a reduced freedom of installation, such as meter boxes in apartment buildings and kitchens and unit bathrooms in houses. The present apparatus 1 is also to be installed additionally into pipe conduits on existing apparatuses that require heating of water used, such as reservoir tanks in bathrooms with a shower and a washing machine. In addition, in this description, the arrow "a" indicates a water flow direction from a water supply valve or the like, and the upstream and downstream sides are defined based on the water flow direction.

[0028] The pipe body 2 has a parallel wavy structure formed on a side surface of a material having electrical insulation and elasticity, such as nylon, to have a flexibility. Also, joints 22 for connection with a water passage pipe 7 and electricity removing means 5 to be described hereinafter are disposed at both end portions of the pipe body 2.

[0029] Each joint 22 includes: a socket 22a for water-tight connection (screwing in the present embodiment) with the water passage pipe 7 or electricity removing means 5; an insert 22b with one end being engaged with the socket 22a while the other end being fitted into the pipe body 2; and a holder 22c fitted around the outer periphery of the insert 22b to hold the pipe body 2. The joints 22 are not limited to the arrangement above and existing techniques may be selected and utilized appropriately as long as they can be maintained and connected water-tightly with the pipe body 2. For example, quick couplers may be adopted.

[0030] Next, multiple water activation pieces 3, 3, 3, ... are arranged in series in the internal space (pipe conduit) 23 of and along the pipe body 2 with spacers 4 as buffer means being interposed therebetween. Each water activation piece 3 is a burned substance (ceramic) molded by containing, for example, multi-element minerals (minerals containing silicon mainly and many other elements in a balanced manner) and artificial tourmalines as major ingredients, and the exterior thereof has a contour shape loosely fittable to the inner pipe wall 21 of the pipe body 2 while the entirety thereof has an approximately cylindrical shape with a water passage port 32 including an axis 31 bored. Loosely fittable to the inner pipe wall 21 of the pipe body 2 means in other words that a small gap is secured between each piece and the inner pipe wall 21 of the pipe body 2 on its lateral cross-sectional view.

Also, the outer and inner peripheral surfaces of each water activation piece 3 are formed with rifling patterns 33 for turning water flow when the axis 31 is positioned parallel to the water flow. These rifling patterns 33 are formed clockwise when viewed from the upstream side. In addition, the rifling patterns 33 may be formed discontinuously on the outer or inner peripheral surface, though continuous in the present embodiment.

[0031] The rifling patterns 33 cause the surface area of each water activation piece 3 to be increased substantially as well as the water flow (indicated by the arrow "a") from the upstream side of the

water activation piece 3 to be turned clockwise (indicated by the arrow "b"). Meanwhile, the technical reason for which the rifling patterns 33 are formed clockwise is that it is empirically and experimentally recognized that turning flowing water clockwise increases its water activation effect.

[0032] Each spacer 4 interposed between water activation pieces is composed of a synthetic resin material having flexibility and elasticity to serve as buffer means for the water activation pieces 3. Also, a small gap is secured between each spacer 4 and the inner pipe wall 21 of the pipe body 2. Each spacer 4 has a disk shape with a contour shape slightly greater than that of each water activation piece 3, and is formed with an opening 41 at the center thereof and eight radial slits 42 communicating with the outer edge portion.

[0033] The arrangement of each spacer 4, that is, having a contour shape greater than that of each water activation piece 3 prevents water activation pieces 3 arranged on either side thereof from being brought into contact with each other, and forming the opening 41 and slits 42 secures a smooth water passage state.

In addition, the spacers 4 are preferably arranged for every one piece to serve as means for securing a bent state of the pipe body 2, for preventing contact between water activation pieces 3, and for absorbing impact to the water activation pieces 3 due to a water hammer phenomenon, but may be arranged for every multiple piece. Also, the shape of each spacer is not limited to disk shape, and may be formed into multiple cut pieces or ball shapes. In this case, the spacers are preferably installed directly at the upper and lower end faces of each water activation piece 3.

[0034] The thus arranged present apparatus 1 may further be arranged in such a manner as to add the following arrangements to the pipe body 2 as appropriate. That is, as shown in Fig.4, the surface of the outer pipe wall 24 of the pipe body 2 may be applied with a coating compound 24a composed of one or more materials selected from graphite and minerals. In addition, the minerals include sedimentary conglomerates such as graphite silica.

[0035] The coating compound 24a emits growth light circumferentially. Here, growth light, which is an electromagnetic wave belonging to a wavelength range of 6 to 14 m of far-infrared, has a "resonance absorption effect" by which the vibration of molecules in objects exposed thereto is amplified, and this amplified vibration causes friction increase between molecules to thereby generate frictional heat. In other words, growth light has a function of converting vibration energy of objects exposed thereto (flowing water) into thermal energy to heat it.

[0036] The entire pipe body 2 may also be covered with a flexible nylon tube 6 containing one or more materials selected from graphite and minerals for emitting growth light to improve the efficiency of the heating function above. The surface of the flexible tube 6 may be applied with a coating compound composed of the foregoing materials. In addition, existing apparatuses to install the present apparatus 1 adopting such a pipe body 2 include ones that require heating of flowing water, such as bathrooms with a shower and a washing machine.

[0037] The electricity removing means 5 is arranged at the terminal part on the downstream side of the present apparatus 1. The electricity removing means 5 includes a conductive chassis 51 composed of a hard material, and in the internal space 57 of the chassis 51, multiple water activation pieces 3 having the arrangements above are arranged in series with spacers 4 being interposed therebetween.

[0038] The chassis 51 is formed by covering approximately the entire outer peripheral surface of a metal cylindrical tube having a predetermined length with an electrically insulating material 52 and covering the outer peripheral surface of the insulating material 52 with a conductive tubular covering body 53. The covering body 53 is provided with a ground terminal 53a for grounding positive ions generated in the present apparatus 1.

[0039] Further, connection tubes 54 and 55 are fitted to both ends of the chassis 51 to cap the openings water-tightly. This fitting is specified in that electrically insulating rings 56 are fitted between the connection tubes 54 and 55 and the corresponding both end portions of the covering body 53 so that the connection tubes 54 and 55 are electrically isolated from the covering body 53. The connection tubes 54 and 55 are connected in series, respectively, with the present apparatus 1 and the water passage pipe 7, and inflow and outflow ports 54a and 55a are formed on the respective upstream and downstream sides.

[0040] In the connection tube 54 on the inflow port side, a male thread 54b for screwing and connecting into one joint 22 of the present apparatus 1 is engraved on the outer peripheral surface of the open end thereof. Meanwhile, in the connection tube 55 on the outflow port side, a female thread 55b for screwing and connecting the water passage pipe 7 is engraved on the inner peripheral surface of the open end thereof.

[0041] In the cylindrical internal space 57 of the chassis 51, multiple water activation pieces 3, 3, 3, ... (four pieces in the present embodiment) are arranged, the same as those arranged within the pipe body 2 of the present apparatus 1. Also, spacers 4 are interposed between water activation pieces 3, as is the case with the present apparatus 1.

[0042] The electricity removing means 5 is preferably installed additionally, though not an essential component of the present apparatus 1, because it exhibits an effect of grounding and removing positive ions in flowing water that are ionized through contact with the water activation pieces 3 and accordingly increases the ratio of negative ions in the flowing water to further improve its water activation effect.

[0043] Since the present apparatus 1 is thus arranged, the flexible pipe body 2 can be bent between water activation pieces 3 arranged in the internal space 23, and therefore the present apparatus can take on various bent states as a whole to have the same feature as so-called flexible tubes. Also, spacers 4 are arranged between the water activation pieces, which can prevent the water activation pieces 3 from being abraded by mutual contact therebetween as well as absorb impact to the water activation pieces 3 due to a water hammer phenomenon.

[0044] In addition, when inflow water (indicated by the arrow "a") through the joint 22 of the pipe body 2 passes through the water activation pieces 3, the flow direction is turned clockwise (indicated by the arrow "b") by the rifling patterns 33 formed on the outer peripheral surface of the pieces and the inner peripheral surface of the water passage port 32. Then, the inflow water is turned at every passage through each water activation piece 3 to take on a clockwise vortex flow state in the pipe body and then discharged as outflow water.

[0045] The outflow water becomes reduced, that is, takes on a so-called activated state by being subjected to the action of far-infrared from the water activation pieces 3 so that hydrogen-bonded clusters in water molecules are segmentalized and by receiving negative ions generated efficiently due to collision and/or friction between the thus segmentalized water molecules.

[0046] The pipe body 2 exhibits not only a flowing water activation effect but also a heating effect if not only applied with a coating compound 24a for emitting growth light but also covered with a flexible tube 6.

Further, since the electricity removing means 5 is installed to ground positive ions generated within the pipe body, the water activation effect is further improved.

[0047] Incidentally, activated water generated through the present apparatus 1 obtains various effects as follows.

For example, obtained is a test result where the quality of tap water with a common bacteria concentration of 530 counts/ml and a coliform detection is positive was improved significantly, after about a two-week installation of the present apparatus 1, to a common bacteria concentration of zero counts/ml and coliform was not detectable. There has also been obtained a test result of a water-softening tendency in which the hardness of water decreased from 94ppm to less than 10ppm after about a one-month installation of the present apparatus 1 into a drinking water pipe conduit.

Thus, the use of activated water treated through the present apparatus has potential for enhancement of cooking flavors and efficacy for the human body such as making skin beautiful and moisturized. There has further been found a cleaning effect without the need for chemical cleaner, which is currently attracting significant attention.

Other Possible Embodiments

[0048] Although the present apparatus 1 adopts a pipe body 2 having electrical insulation, it is only required that the inner pipe wall 21 of the pipe body 2 has electrical insulation, and therefore a metal blade may be fitted around the pipe body 2, for example, to improve the protection of the pipe body 2. In this case, the blade is preferably grounded through a ground terminal.

[0049] In addition, although the water activation pieces 3 are each formed with concavo-convex rifling patterns 33 on the outer and inner peripheral surfaces thereof, the rifling patterns 33 may be composed of a combination of so-called individual fins. Further, multiple water passage ports 32 may be bored for each water activation piece 3 (e.g. multiple water passage ports may be formed as in artificial coal).

Brief Description of the Drawings

[0050]

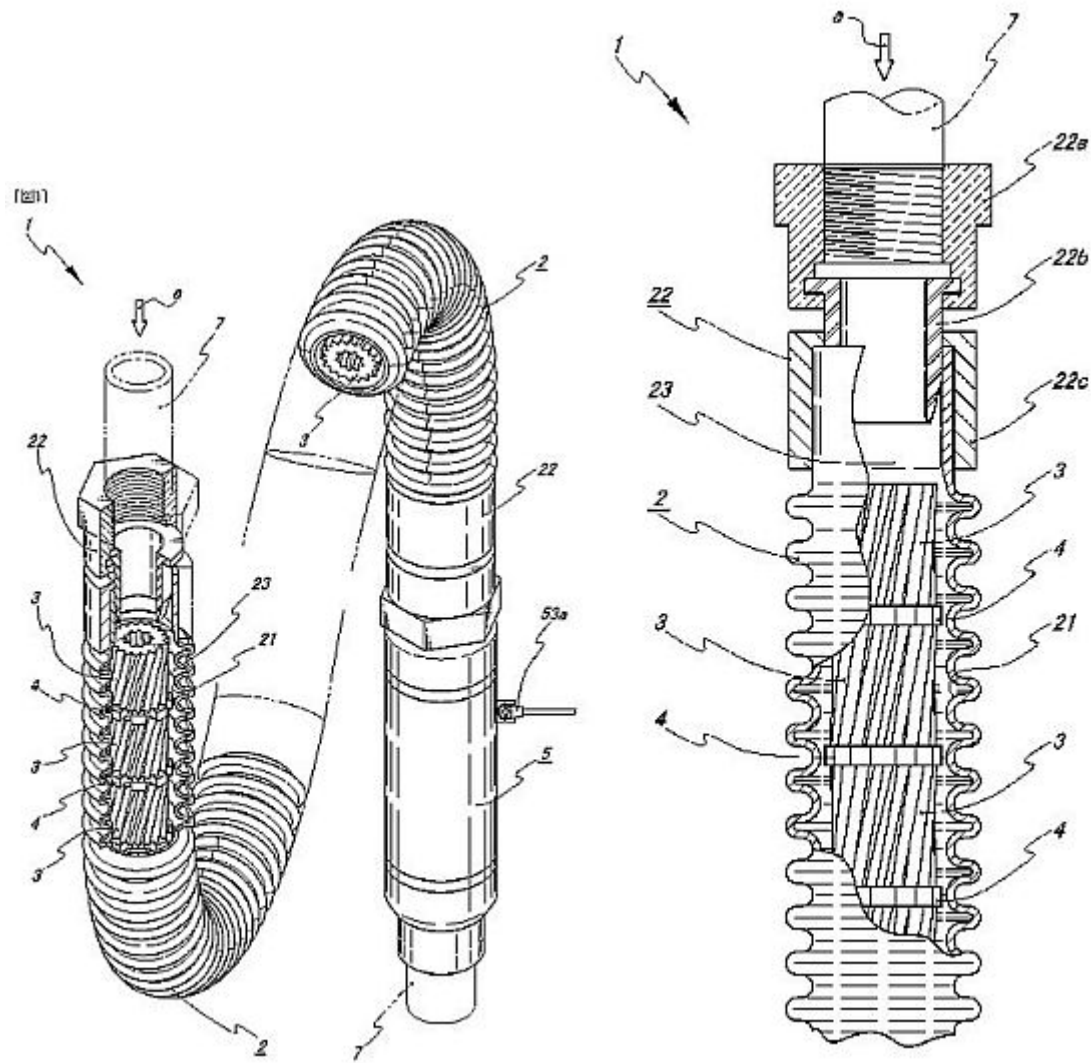
[Fig.1] A perspective view of the present apparatus partially cut away;

[Fig.2] A vertical cross-sectional view of the present apparatus;

[Fig.3] An assembled perspective view of the present apparatus;

[Fig.4] A perspective view of the present apparatus partially cut away;

[Fig.5] A perspective view of electricity removing means in the present apparatus partially cut away.



Description of the Reference Numerals

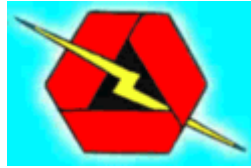
[0051]

- 1: Present apparatus
- 2: Pipe body
- 21: Inner pipe wall
- 22: Joint
- 22a: Socket
- 22b: Insert
- 22c: Holder
- 23: Internal space
- 24: Outer pipe wall
- 24a: Coating compound
- 3: Water activation piece
- 31: Axis
- 32: Water passage port
- 33: Rifling pattern
- 4: Spacer
- 41: Opening
- 42: Slit
- 5: Electricity removing means
- 51: Chassis
- 52: Insulation material
- 53: Covering body
- 53a: Ground terminal
- 54: Connection tube (on the inflow port side)
- 54a: Inflow port
- 54b: Male thread
- 55: Connection tube (on the outflow port side)
- 55a: Outflow port
- 55b: Female thread
- 56: Insulating ring
- 57: Internal space
- 6: Tube
- 7: Water passage pipe

CIRCULATION-TYPE ACTIVE WATER PRODUCTION APPARATUS WO2007060719

[PROBLEMS] To provide a circulation-type active water production apparatus that produces active water in a highly active state, can store a large amount of the active water while maintaining the highly active state, and can supply the stored active water at a proper time. [MEANS FOR SOLVING PROBLEMS] The circulation-type active water production apparatus comprises a water storage tank (2) having, on its bottom side, a water discharge port (23) for discharging water along clockwise whirling vortex flow in top view, a water pipe (3) for feeding water from the water discharge port in the water storage tank to a water activation apparatus (5) by water feed means (4), a feed-water pipe (7) for feeding the water treated in the water activation apparatus to the water storage tank, and a water discharge nozzle (8); connected from the feed-water pipe to the upper part side within the water storage tank, for discharging the water in such a direction that promotes the formation of the same clockwise whirling vortex flow in the water stored in the water storage tank. An air nozzle (24) for discharging air bubbles, which is likewise whirled clockwise, to a part around

the water discharge port is provided, and branch means (6) is provided along the water pipe, for branching water flow circulated through the pathway. A water activation material is disposed within the water activation apparatus. The water activation material is a ceramic material composed mainly of a specific mineral.



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