DUAL CHEMICAL METER

PURPOSE OF THE INVENTION

The invention refers to an apparatus to measure phosphorous chemical product (temephos or abate) impregnated in crystallized sand that can be washed out inside the hollow interior of the meter, where the impregnated crystallized sand, upon contact with a liquid, delivers a liquid solution of this material *impregnated in the sand to one part per million of for example, a larvicide substance in a container,* which can be a water reservoir. More particularly, this invention refers to a dual chemical applicator of a pesticide substance impregnated in crystallized sand that distributes, through flotation, controlled and measured amounts of a liquid solution that results from washing out sand impregnated with phosphorous chemical products that kills mosquito larvae, for example, Abate, for the elimination and treatment of water storage systems.

The dual chemical meter works in such a way that the washing liquid, for example, water, is put in controlled contact with the phosphorous chemical material impregnated in crystallized sand in solid form in a dissolution area and circular clay impregnated with temephos, when the impregnated sand comes in contact with the water it washes out in the liquid in a controlled way, that is, the floater's movement allows the water molecule to bind to a temephos molecule and later the resulting solution flows outside of the meter to modify the initial composition of the liquid stored in a container, for example, a water reservoir, and kill mosquito larvae, after washing out the sand the circular clay impregnated with 1% of temephos will create a residual effect, increasing the efficiency of the abate, which has been proven with tests performed in the IPK, a laboratory that works with the WHO/PAHO, where it was proven with 5 different brands of temephos that the use of the meter produces much better results in terms of the efficiency of the temephos.

BACKGROUND

In addition to the complex systems currently used to treat fluids using a chemical metering method, some solid chemical product feeders are known, such as, calcium hypochlorite, which create aqueous solutions that contain sanitizing agents that have been used to disinfect blackwater treatment plant effluents and drinking water supplies or for water chlorination in pools, hot tubs, water tanks and other. Most of these feeders are kept within a limited area inside the container in which they are, except for a chemical meter that is kept floating, which results in the correct metering of a dissolution of the solid chemical product in the liquid.

The Mexico Utility Model MX/U/2009/449, TITULO DE MODELO DE UTILIDAD 2377, of my previous invention, describes an apparatus to meter a solid chemical material in a liquid that distributes through flotation controlled and metered amounts of a liquid solution of chemical products initially in a

solid phase, this metering apparatus has the characteristics of a meter with a hollow body, with at least two perforations vertically aligned on one side and at least one opposed perforation, with a spherical floater in its upper part and a counterweight in its lower part, with the purpose of creating a rocking movement for the application of the product that resulted from the dilution inside the hollow interior of the apparatus and aimed at sanitizing domestic use water reservoirs.

US Patent 5,089,127 describes a chemical feeder to distribute a solid sanitizing agent, such as calcium hypochlorite, in a closed water circulation system, such as a flow circuit for pools. This apparatus provides a parts device that includes a container which holds tablets of a solid chemical sanitizing material and whose bottom wall is perforated to allow contact between water and the solid chemical material to form an aqueous solution that is distributed to the water source. Consequently, the chemical feeders that produce aqueous solutions of sanitizing agents are used to treat water in recreational places to bathe, swim and hot tubs, blackwater plants, drinking water supplies, some of them are described in US patents numbers 3,595,786; 3,595,395; 4,584, 106; 154,732,689; 4,759,907; 4,842,729; 5,089,127; 5,427,748; 5,441,71 1; 5,447,641; 5,932,093, and 6,077,484 .

It is clear that the existing chemical feeders have not been designed to kill mosquito larvae, they have been designed to sanitize water containers with both large volumes of water and for domestic use with a constant concentration of a solid chemical that, when mixed with a liquid, dissolves and applies metered amounts of a chemical solution that was initially in a solid phase but that only works to sanitize and not to kill mosquito larvae, the chemical meter of my previous invention was created to apply water disinfecting tablets that can kill bacteria, virus and parasites that live in stored water and eliminate the microenvironment in which mosquito larvae develop, but it does not kill mosquito larvae.

According to the previous requirements, my invention is a dual chemical meter that allows the entrance of the liquid that will be mixed inside it with the phosphorous chemical material impregnated in the sand when it is washed out and which will subsequently release the mixture resulting from the contact between them to the container that will release doses of the phosphorous chemical product that will properly kill mosquito larvae. This phosphorous chemical material meter was born from the need to constantly and permanently apply doses of the said product, it is known that for the molecule of the phosphorous chemical product to be released it needs to be "taken" by a water molecule, to do so, the water must be in constant movement to bind to the temephos, that is why until now, doses of temephos applied incorrectly in water reservoirs do not kill all mosquito larvae because of a lack of water circulation to bind temephos molecules and surviving larvae becoming immune to temephos. The incorrect application means that when the temephos is applied directly in a water reservoir, such as a water tank, the bottom part of the water storage reservoir usually has sediment or some type of organic matter that "absorbs" the grains of sands that have temephos, preventing that water from having contact with the temephos nullifying its action, because they are "buried" in the sediments or organic matter and

the larvicide impregnated in the sand cannot be released to fulfill its action of killing mosquito larvae, another common application of temephos is to put several amounts of it into plastic bags and punching a few holes in them when placed to the reservoir and then throwing the bags into the container to be treated, where the bag containing the abate goes to the bottom of the container and is often "buried" in the organic matter or sediment that is in the bottom of the container, when this does not happen, the grains of sand are "encapsulated" in the bag and they cannot come into contact with the water and begin acting correctly, that is, releasing temephos molecules bound to water molecules, because although the bag contains vast and sufficient amounts to kill the existing larvae in a reservoir, they do not die because the real amount of temephos released was not sufficient to kill such an annoying plague because more than 60% of the larvicide product is "encapsulated" inside the perforated bag.

The application in these cases can initially make a "larvicide bomb" that can kill a considerable amount of mosquito larvae, but the larvae that survive these lethal doses become immune to temephos and when they reach the oviposition stage, that is, when they lay eggs in the water reservoirs, the larvae that come out of this new generation of mosquitoes are more resistant to temephos, this has required increasingly large doses of temephos but produces the same inefficient results and has only resulted in mosquito larvae that are increasingly immune to temephos, which leads to recurrent outbreaks of dengue fever in its two variations, classic and hemorrhagic, which have caused many deaths, especially in tropical areas, this new invention to apply temephos with the dual chemical meter allows to eliminate all the mosquito larvae that can exist in a water reservoir, such as a water tank, with amounts smaller than those currently used, and it is innocuous for humans because the invention applies a dosage of one part per million, which is the dosage accepted by the World Health Organization for application in water for human use and consumption. Likewise, my invention saves close to 50% of the resources allocated (both human and financial) to battle dengue fever, on the other hand, my current invention, the dual chemical meter has two applicators, the first application is direct when the phosphorous chemical product comes into contact with the liquid in the reservoir to be treated, the second application has a residual effect that will result when the sand is "washed," the sand is washed when it no longer has the phosphorous chemical impregnated because it has already been applied due to the permanent movement of the dual chemical meter to constantly float, in this rocking movement, part of this sand is "thrown" outside of the dual chemical meter in such a way that when the sand has been "washed out," close to 50% of it has been thrown outside of the container and the circular clay that was "covered" with the sand is now in more direct contact with the water and begins its action applying temephos to the 1% with which it was impregnated, reaching a dual application and, thus, a residual effect.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a front view of the complete meter with a cross section, where each of the component parts are illustrated.

FIG. 2 shows a perspective view of the meter with a cross section where the component parts are illustrated.

FIG. 3 shows a side view of the complete meter with a phosphorous chemical product impregnated in sand (8), which is inside it slightly tilted towards the right side due to the rocking motion of the dual chemical meter coming into contact with the moving water, the threaded floater (4) and the circular clay counterweight (5) are illustrated.

FIG. 4 shows a perspective view tilted towards the right that shows the limit allowed (7) and controlled of water that enters the meter to be in contact with the phosphorous chemical product impregnated in crystallized sand (8), in addition, three marks are shown that indicate the grams of temephos for each level, to have a more precise application and an increased efficiency in the elimination of mosquito larvae depending on the desired degree of infestation or control in specific areas.

FIG. 5 shows the permanent position of the meter in the container and the way it meters (13) the result of washing out the phosphorous chemical product impregnated in the crystallized sand, also, it shows the metering is in the lower perforation (2).

FIG. 6 shows with arrows pointing up from the softer material base (10) where the circular clay (8) is "pushed" from its position to be impregnated again.

DETAILED DESCRIPTION OF THE INVENTION

As can be seen in FIGS. 1 and 2 the Dual Chemical Meter includes a hollow body (1) made of some type of polymer, such as polyethylene, polycarbonate, polyvinyl chloride or other material with similar characteristics, that can be cylindrical or have any other geometric shape and which has at least one lower opposed perforation (2) vertically aligned along one side and at least one upper opposed perforation (3), although in the figures this embodiment shows two lower perforations (2) and one upper opposed perforation (3), my current invention, the dual chemical meter, can have at least one lower perforation because my invention uses sand (8) and it does not compact or change its physical shape and there is no danger of obstruction in the meter hole, this sand will always have the same characteristics it had when it was impregnated, except that with constant use the pesticide that it was impregnated with initially will wash out, in the case of this invention, a lower perforation opposed to another perforation that is higher is sufficient to apply the doses of one part per million of temephos which is what global health standards require to eliminate mosquito larvae while being innocuous to humans. In FIGS. 1 and 2, a spheric floater is shown in the upper portion but a champagne cork style (4) in the lower portion, with thread on the inside and bottom (12), that features a spheric floater hermetic seal, in addition, in the lower part of the neck (6) the meter has an end (11) that does not allow the floater to go inside beyond the half point into the meter, this allows for flotation with the various grams of impregnated sand (9) that will be used

and there is also the possibility of refilling the meter as many times as necessary because the floater can be removed and placed again as many times as necessary, this floater can be a material that floats, for example, a polymer, such as polyethylene, polycarbonate, polyvinyl chloride or other material with similar features, which allows to maintain the meter in permanent flotation and constant movement inside the liquid solution reservoir into which it the meter is introduced to apply the chemical material that it contains inside and also, this floater (4) works as a type of umbrella to protect from sun rays to prevent them from degrading the phosphorous chemical material impregnated in the crystallized sand in case the container into which it was applied, for example a water tank, is uncovered, therefore, another alternative is to apply a coat of solar filter to it. Likewise, FIGS. 1 and 2 show the circular clay (5) that has a porosity between 3 and 5 micras, this circular clay is in the bottom of the hollow container whose base is softer (14) to maintain the meter in a vertical position and prevent it from shifting into a horizontal position, in addition, this counterweight, that is, the circular clay (5) impregnated with temephos at 1%, fulfills an important function because it is the second applicator of temephos, this circular clay causes the residual effect, this happens when there is only approximately 50% of sand left in the container and with the rocking motion with the water almost all the clay is uncovered and then the temephos molecules impregnated in the porosity of the clay bind to the water molecules, that is, after the impregnated sand is washed out from the chemical pesticide that is impregnated in the grains of sand and there is so little sand that with the wash out rocking motion grains are lost through the metering perforations and this allows the water to reach the clay and start contact between the water and the temephos molecules stores in the clay's porosity, this porosity is achieved by mixing the clay with 30% of hay or sawdust and it must be mixed with water for 45 to 75 minutes until it achieves a texture that is easy to handle without losing its shape (gooey), after a rest period of between 36 and 48 hours the clay is baked to harden for 5 to 7 hours, this way, when the hay or the sawdust is burnedthe desired micras are obtained, this clay is impregnated with a phosphorous pesticide that was impregnated by leaving the circular clay counterweight in a pile with phosphorous pesticide for a period between 36 and 48 hours so that the open pores absorb and impregnate the circular clay with 1% of temephos and so that it has a residual effect after the chemical pesticide that was impregnated in the grains of crystallized sand has been washed out. FIG. 3 shows the complete meter and the phosphorous chemical material impregnated in crystallized sand (8), it also shows the soft base (14) that serves to place the counterweight (5), it also shows the floater (4) sealed all the way to the end (11). FIG. 4 shows three level marks identified with number 20, 30, 40 (9) that shoe the level of grams of crystallized sand impregnated (8) with a phosphorous chemical that it has to contain based on the concentrations of abate that need to be metered and the level of the liquid solution (7). FIG. 5 shows the meter floating in the container, slightly tilted towards the left to "apply" the temephos molecules bound to the water, that is, the mixture resulting from the contact of the phosphorous pesticide with the water, meanwhile, it shows, as an example in this embodiment, two lower perforations (2) through which the result of the phosphorous chemical material that was impregnated in the crystalline sand and then was washed out

FIG. 6 shows how the circular clay (8) can be extracted by pressing (10) on the base (13) of the softer material from the bottom up, with the goal of impregnating it once again with the phosphorous pesticide upon its removal from the container whenever required to continue providing a residual temephos effect.

Once the meter is inside the reservoir that contains the liquid solution to be metered, the discharge of this liquid solution into the reservoir creates a rocking motion in the meter due to the counterweight of the circular clay that is in the bottom part (5), this allows the liquid solution (7) to enter into the hollow body of the meter (1) through the upper perforation (3) that is on the right side of the device, as is shown in FIG. 4. Once the liquid solution has entered into the hollow body of the meter, where the phosphorous chemical material is impregnated in the crystallized sand (8), a mixture starts to form with the washout between it and the liquid solution, during the rocking motion of the washout part of the sand escapes and part of it is slowly lost, that is, when the water enters the hollow body and touches the impregnated sand in this process a molecule of temephos binds to a molecule of water because temephos molecules can only be bound to water molecules when there is a water current, that is, solely and exclusively the rocking motion inside the container "releases" the temephos molecules, because there can be impregnated sand in a water reservoir, but if the water molecule does not reach the temephos molecule, it cannot be released from the sand and therefore no mosquito larvae will be killed, therefore, the inertia generated by the rocking motion of the meter triggers the release of the metered liquid solution of temephos towards the reservoir, through at least one perforation (2) opposed to the upper perforation (3) through which the liquid solution enters, "mixes" and "meters" as shown in FIG. 5. The dual chemical meter is maintained in a vertical position and in permanent flotation inside the liquid solution reservoir. The meter is also maintained in constant circulation inside the reservoir and as a result of the rocking motion with which the liquid solution enters the hollow body to slowly wash out the phosphorous chemical material impregnated in the crystallized sand, and then the correct amount of resulting mixture (13) is released throughout the reservoir, metering one part per million of temephos, which is enough to kill mosquito larvae and is innocuous to humans, as has been proven in the WHO/PAHO collaboration laboratory, which guaranteed the efficiency of mosquito larvae annihilation and the largest durability of temephos of at least 5 brands of temephos from 4 countries; the rocking motion is generated when the reservoir that contains the meter is filled, this creates "waves" in the liquid that falls in to the reservoir that create a rocking motion in the meter because the counterweight "pulls" the meter down and the floater "takes" it up but always maintaining a vertical position, this vertical position of the meter inside the reservoir and its permanent floating maintain the water pressure between the floater (4) and the bottom of the meter (14) so that it can inject the concentrated liquid solution resulting from the mixture between the liquid solution and the phosphorous chemical material impregnated in the crystallized and without diluting the chemical material, because it will always retain its granular form, and this way the residual temephos effect is sustained for a longer period, maintaining the water reservoirs free of mosquito larvae that can lead to fatal diseases such as hemorrhagic dengue fever.

PREFERRED EMBODIMENT OF THE INVENTION

A cylindrical device is shown with at least one perforation on one side and on the opposed part an upper perforation, both duly calibrated to meter in a controlled manner a liquid with temephos in an amount of one part per million, obtained by washing out the sand impregnated with a phosphorous chemical with the permanent rocking motion of the meter, this cylindrical device has a counterweight of clay with open pores between 3 and 5 micras impregnated with a phosphorous pesticide that can be removed to impregnate again with the phosphorous pesticide and again have a residual effect, a floater as shown in the figures, the meter body (1) is a light hollow body, which is previously obtained using a molding/blowing or rotational molding technique, which includes the perforations (2 and 3). Inside this body a counterweight (5) is placed in the bottom part and the amount of the phosphorous chemical material impregnated in crystallized sand (8) that will be used is introduced. In the upper part of the meter body (1) is a floater (4), which can be placed by threading, pressure or any other way that allows to keep it in fixed to the upper part of the meter body, depending on its physical characteristics.

CLAIMS

Having described my invention in a sufficient and clear way, I consider it to be a novelty and therefore claim as my exclusive property what is contained in the following clauses:

1. Dual chemical meter with crystallized sand impregnated with a phosphorous chemical that includes a hollow cylindrical body where the center of the bottom part is not flat but forms a hollow cylinder that extends down in the shape of a pendulum that in addition serves as a base to insert the counterweight with pressure and the counterweight also has the very important function to apply the residual part of temephos to 1% when the sand has been washed out, another characteristic is that the base only covers half of the clay counterweight, this allows to remove it from its position by pushing the base from the bottom up to again impregnate phosphorous pesticide in its to continue having a residual effect, the upper part of the meter forms a neck with an end where a floater is placed, but this neck forms a snap-on thread that seals hermetically so that once the floater has been pressured into place it does not come out of its position but at the same time it facilitates the intentional removal of the floater to refill the meter with crystallized sand impregnated with phosphorous chemical product, in addition, the lower part of the neck has an end to prevent more than half of the floater from being inside the meter. The meter has at least one lower perforation aligned vertically and at least one perforation opposed to it at a larger height; where the lower portion has a clay counterweight with porosity for residual release and this porosity if between three and five micras impregnated with a phosphorous chemical and in the upper portion it has a floater.

2. Dual chemical meter, where as claimed in the previous clause, the hollow body that forms it is made of a light material of some polymer, such as polyethylene, polycarbonate, polyvinyl chloride or a similar material and can be cylindrical or any other geometric shape, where the interior or hollow space can house the phosphorous chemical material that impregnates a crystallized sand and when it enters into contact with a liquid it washes it out and meters one part per million of temephos.

3. Chemical meter, which as claimed in the first clause, has a clay counterweight with porosity between three and five microns or any other inert material that can be spherical or any other geometric shape.

4. Chemical meter, which as claimed in the first clause, has a spheric or any other geometric shape floater, made from any polymer, such as polyethylene, polycarbonate, polyvinyl chloride or any other material with similar characteristics that enables the flotation of the meter.

5. Chemical meter, which as claimed in the first clause, has a hollow cylindrical body where the phosphorous chemical material impregnated in crystallized sand is placed, and where the cylinder's diameter is reduced in the bottom part creating a type of neck and in the lowest part the cylinder expands again to a diameter that is smaller than the diameter of the section where the soluble chemical material is contained, resulting in a cavity inside which the counterweight is placed. The hollow cylindrical meter has a snap-on spheric floater. The floater is kept in place due to a special L-shaped ribbed edge in the upper part that acts as a lock to prevent the floater from coming out of the meter, the floater is placed with pressure up to an end that is on the meter's neck so that it does not penetrate further into the meter. Once the floater has been locked it also serves to protect the chemical product from solar rays that could accelerate its degradation. In the bottom part of the cylindrical meter a duly centered space is formed that extends down to form a type of pendulum that holds a counterweight that is pressed into place to keep it in its base, with the characteristic that only half of the counterweight penetrates and it can be removed by pressing from the bottom up, this counterweight maintains the meter in a vertical position inside the liquid of the reservoir increasing the efficiency of the metering of the phosphorous chemical impregnated in crystallized sand, in addition this counterweight serves as the second form to apply temephos, that is, the residual or dual application.

SUMMARY

Chemical meter to wash out a phosphorous chemical material impregnated in crystallized sand in a liquid where the resulting mixture will be metered at one part per million in a container of the liquid that will be treated with temephos to eliminate mosquito larvae with includes at least two perforations, where at least

one of them allows the liquid to enter the meter and the other allows the release of the substance resulting from the mixture of the phosphorous chemical material impregnated in crystallized sand and which when washed out applies a mixture of one part per million of temephos that eliminate mosquito larvae. The dual chemical meter has a functional feature due to its physical properties, which is that, inside the container with the liquid that will be metered, it has a rocking motion that results from the floater and the counterweight that constitute it, which results in a more efficient metering of the mixture obtained and therefore simplifies the process of treating a liquid contained in a container with a phosphorous chemical material impregnated in crystallized sand and that applies temephos in one part per million based on the WHO's specifications for innocuousness of the pesticide that eliminates mosquito larvae when applied in water for human use and consumption.

[Translation from Spanish]

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PURPOSE OF THE INVENTION

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The dual chemical meter works in such a way that the washing liquid, for example, water, is put in controlled contact with the phosphorous chemical material impregnated in crystallized sand in solid form in a dissolution area and circular clay impregnated with temephos, when the impregnated sand comes in contact with the water it washes out in the liquid in a controlled way, that is, the floater's movement allows the water molecule to bind to a temephos molecule and later the resulting solution flows outside of the meter to modify the initial composition of the liquid stored in a container, for example, a water reservoir, and kill mosquito larvae, after washing out the sand the circular clay impregnated with 1% of temephos will create a residual effect, increasing the efficiency of the abate, which has been proven with tests performed in the IPK, a laboratory that works with the WHO/PAHO, where it was proven with 5 different brands of temephos that the use of the meter produces much better results in terms of the efficiency of the temephos.

BACKGROUND

In addition to the complex systems currently used to treat fluids using a chemical metering method, some solid chemical product feeders are known, such as, calcium hypochlorite, which create aqueous solutions that contain sanitizing agents that have been used to disinfect blackwater treatment plant effluents and drinking water supplies or for water chlorination in pools, hot tubs, water tanks and other. Most of these feeders are kept within a limited area inside the container in which they are, except for a chemical meter that is kept floating, which results in the correct metering of a dissolution of the solid chemical product in the liquid.

The Mexico Utility Model MX/U/2009/449, TITULO DE MODELO DE UTILIDAD 2377, of my previous invention, describes an apparatus to meter a solid chemical material in a liquid that distributes through flotation controlled and metered amounts of a liquid solution of chemical products initially in a solid phase, this metering apparatus has the characteristics of a meter with a hollow body, with at least two perforations vertically aligned on one side and at least one opposed perforation, with a spherical floater in its upper part and a counterweight in its lower part, with the purpose of creating a rocking movement for the application of the product that resulted from the dilution inside the hollow interior of the apparatus and aimed at sanitizing domestic use water reservoirs.

US Patent 5,089,127 describes a chemical feeder to distribute a solid sanitizing agent, such as calcium hypochlorite, in a closed water circulation system, such as a flow circuit for pools. This apparatus provides a parts device that includes a container which holds tablets of a solid chemical sanitizing material and whose bottom wall is perforated to allow contact between water and the solid chemical material to form an aqueous solution that is distributed to the water source. Consequently, the chemical feeders that produce aqueous solutions of sanitizing agents are used to treat water in recreational places to bathe, swim and hot tubs, blackwater plants, drinking water supplies, some of them are described in US patents numbers 3,595,786; 3,595,395; 4,584, 106; 154,732,689; 4,759,907; 4,842,729; 5,089,127; 5,427,748; 5,441,71 1; 5,447,641; 5,932,093, and 6,077,484 .

It is clear that the existing chemical feeders have not been designed to kill mosquito larvae, they have been designed to sanitize water containers with both large volumes of water and for domestic use with a constant concentration of a solid chemical that, when mixed with a liquid, dissolves and applies metered amounts of a chemical solution that was initially in a solid phase but that only works to sanitize and not to kill mosquito larvae, the chemical meter of my previous invention was created to apply water disinfecting tablets that can kill bacteria, virus and parasites that live in stored water and eliminate the microenvironment in which mosquito larvae develop, but it does not kill mosquito larvae.

According to the previous requirements, my invention is a dual chemical meter that allows the entrance

of the liquid that will be mixed inside it with the phosphorous chemical material impregnated in the sand when it is washed out and which will subsequently release the mixture resulting from the contact between them to the container that will release doses of the phosphorous chemical product that will properly kill mosquito larvae. This phosphorous chemical material meter was born from the need to constantly and permanently apply doses of the said product, it is known that for the molecule of the phosphorous chemical product to be released it needs to be "taken" by a water molecule, to do so, the water must be in constant movement to bind to the temephos, that is why until now, doses of temephos applied incorrectly in water reservoirs do not kill all mosquito larvae because of a lack of water circulation to bind temephos molecules and surviving larvae becoming immune to temephos. The incorrect application means that when the temephos is applied directly in a water reservoir, such as a water tank, the bottom part of the water storage reservoir usually has sediment or some type of organic matter that "absorbs" the grains of sands that have temephos, preventing that water from having contact with the temephos nullifying its action, because they are "buried" in the sediments or organic matter and the larvicide impregnated in the sand cannot be released to fulfill its action of killing mosquito larvae, another common application of temephos is to put several amounts of it into plastic bags and punching a few holes in them when placed to the reservoir and then throwing the bags into the container to be treated, where the bag containing the abate goes to the bottom of the container and is often "buried" in the organic matter or sediment that is in the bottom of the container, when this does not happen, the grains of sand are "encapsulated" in the bag and they cannot come into contact with the water and begin acting correctly, that is, releasing temephos molecules bound to water molecules, because although the bag contains vast and sufficient amounts to kill the existing larvae in a reservoir, they do not die because the real amount of temephos released was not sufficient to kill such an annoying plague because more than 60% of the larvicide product is "encapsulated" inside the perforated bag.

The application in these cases can initially make a "larvicide bomb" that can kill a considerable amount of mosquito larvae, but the larvae that survive these lethal doses become immune to temephos and when they reach the oviposition stage, that is, when they lay eggs in the water reservoirs, the larvae that come out of this new generation of mosquitoes are more resistant to temephos, this has required increasingly large doses of temephos but produces the same inefficient results and has only resulted in mosquito larvae that are increasingly immune to temephos, which leads to recurrent outbreaks of dengue fever in its two variations, classic and hemorrhagic, which have caused many deaths, especially in tropical areas, this new invention to apply temephos with the dual chemical meter allows to eliminate all the mosquito larvae that can exist in a water reservoir, such as a water tank, with amounts smaller than those currently used, and it is innocuous for humans because the invention applies a dosage of one part per million, which is the dosage accepted by the World Health Organization for application in water for human use and consumption. Likewise, my invention saves close to 50% of the resources allocated (both human and financial) to battle dengue fever, on the other hand, my current invention, the dual chemical meter has

two applicators, the first application is direct when the phosphorous chemical product comes into contact with the liquid in the reservoir to be treated, the second application has a residual effect that will result when the sand is "washed," the sand is washed when it no longer has the phosphorous chemical impregnated because it has already been applied due to the permanent movement of the dual chemical meter to constantly float, in this rocking movement, part of this sand is "thrown" outside of the dual chemical meter in such a way that when the sand has been "washed out," close to 50% of it has been thrown outside of the container and the circular clay that was "covered" with the sand is now in more direct contact with the water and begins its action applying temephos to the 1% with which it was impregnated, reaching a dual application and, thus, a residual effect.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a front view of the complete meter with a cross section, where each of the component parts are illustrated.

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FIG. 4 shows a perspective view tilted towards the right that shows the limit allowed (7) and controlled of water that enters the meter to be in contact with the phosphorous chemical product impregnated in crystallized sand (8), in addition, three marks are shown that indicate the grams of temephos for each level, to have a more precise application and an increased efficiency in the elimination of mosquito larvae depending on the desired degree of infestation or control in specific areas.

FIG. 5 shows the permanent position of the meter in the container and the way it meters (13) the result of washing out the phosphorous chemical product impregnated in the crystallized sand, also, it shows the metering is in the lower perforation (2).

FIG. 6 shows with arrows pointing up from the softer material base (10) where the circular clay (8) is "pushed" from its position to be impregnated again.

DETAILED DESCRIPTION OF THE INVENTION

As can be seen in FIGS. 1 and 2 the Dual Chemical Meter includes a hollow body (1) made of some type of polymer, such as polyethylene, polycarbonate, polyvinyl chloride or other material with similar characteristics, that can be cylindrical or have any other geometric shape and which has at least one lower opposed perforation (2) vertically aligned along one side and at least one upper opposed perforation (3), although in the figures this embodiment shows two lower perforations (2) and one upper opposed perforation (3), my current invention, the dual chemical meter, can have at least one lower perforation because my invention uses sand (8) and it does not compact or change its physical shape and there is no danger of obstruction in the meter hole, this sand will always have the same characteristics it had when it was impregnated, except that with constant use the pesticide that it was impregnated with initially will wash out, in the case of this invention, a lower perforation opposed to another perforation that is higher is sufficient to apply the doses of one part per million of temephos which is what global health standards require to eliminate mosquito larvae while being innocuous to humans. In FIGS. 1 and 2, a spheric floater is shown in the upper portion but a champagne cork style (4) in the lower portion, with thread on the inside and bottom (12), that features a spheric floater hermetic seal, in addition, in the lower part of the neck (6) the meter has an end (11) that does not allow the floater to go inside beyond the half point into the meter, this allows for flotation with the various grams of impregnated sand (9) that will be used and there is also the possibility of refilling the meter as many times as necessary because the floater can be removed and placed again as many times as necessary, this floater can be a material that floats, for example, a polymer, such as polyethylene, polycarbonate, polyvinyl chloride or other material with similar features, which allows to maintain the meter in permanent flotation and constant movement inside the liquid solution reservoir into which it the meter is introduced to apply the chemical material that it contains inside and also, this floater (4) works as a type of umbrella to protect from sun rays to prevent them from degrading the phosphorous chemical material impregnated in the crystallized sand in case the container into which it was applied, for example a water tank, is uncovered, therefore, another alternative is to apply a coat of solar filter to it. Likewise, FIGS. 1 and 2 show the circular clay (5) that has a porosity between 3 and 5 micras, this circular clay is in the bottom of the hollow container whose base is softer (14) to maintain the meter in a vertical position and prevent it from shifting into a horizontal position, in addition, this counterweight, that is, the circular clay (5) impregnated with temephos at 1%, fulfills an important function because it is the second applicator of temephos, this circular clay causes the residual effect, this happens when there is only approximately 50% of sand left in the container and with the rocking motion with the water almost all the clay is uncovered and then the temephos molecules impregnated in the porosity of the clay bind to the water molecules, that is, after the impregnated sand is washed out from the chemical pesticide that is impregnated in the grains of sand and there is so little sand that with the wash out rocking motion grains are lost through the metering perforations and this allows the water to reach the clay and start contact between the water and the temephos molecules stores in the

clay's porosity, this porosity is achieved by mixing the clay with 30% of hay or sawdust and it must be mixed with water for 45 to 75 minutes until it achieves a texture that is easy to handle without losing its shape (gooey), after a rest period of between 36 and 48 hours the clay is baked to harden for 5 to 7 hours, this way, when the hay or the sawdust is burnedthe desired micras are obtained, this clay is impregnated with a phosphorous pesticide that was impregnated by leaving the circular clay counterweight in a pile with phosphorous pesticide for a period between 36 and 48 hours so that the open pores absorb and impregnate the circular clay with 1% of temephos and so that it has a residual effect after the chemical pesticide that was impregnated in the grains of crystallized sand has been washed out. FIG. 3 shows the complete meter and the phosphorous chemical material impregnated in crystallized sand (8), it also shows the soft base (14) that serves to place the counterweight (5), it also shows the floater (4) sealed all the way to the end (11). FIG. 4 shows three level marks identified with number 20, 30, 40 (9) that shoe the level of grams of crystallized sand impregnated (8) with a phosphorous chemical that it has to contain based on the concentrations of abate that need to be metered and the level of the liquid solution (7). FIG. 5 shows the meter floating in the container, slightly tilted towards the left to "apply" the temephos molecules bound to the water, that is, the mixture resulting from the contact of the phosphorous pesticide with the water, meanwhile, it shows, as an example in this embodiment, two lower perforations (2) through which the result of the phosphorous chemical material that was impregnated in the crystalline sand and then was washed out.

FIG. 6 shows how the circular clay (8) can be extracted by pressing (10) on the base (13) of the softer material from the bottom up, with the goal of impregnating it once again with the phosphorous pesticide upon its removal from the container whenever required to continue providing a residual temephos effect.

Once the meter is inside the reservoir that contains the liquid solution to be metered, the discharge of this liquid solution into the reservoir creates a rocking motion in the meter due to the counterweight of the circular clay that is in the bottom part (5), this allows the liquid solution (7) to enter into the hollow body of the meter (1) through the upper perforation (3) that is on the right side of the device, as is shown in FIG. 4. Once the liquid solution has entered into the hollow body of the meter, where the phosphorous chemical material is impregnated in the crystallized sand (8), a mixture starts to form with the washout between it and the liquid solution, during the rocking motion of the washout part of the sand escapes and part of it is slowly lost, that is, when the water enters the hollow body and touches the impregnated sand in this process a molecule of temephos binds to a molecule of water because temephos molecules can only be bound to water molecules when there is a water current, that is, solely and exclusively the rocking motion inside the container "releases" the temephos molecules, because there can be impregnated sand in a water reservoir, but if the water molecule does not reach the temephos molecule, it cannot be released from the sand and therefore no mosquito larvae will be killed, therefore, the inertia generated by the rocking motion of the meter triggers the release of the metered liquid solution of temephos towards

the reservoir, through at least one perforation (2) opposed to the upper perforation (3) through which the liquid solution enters, "mixes" and "meters" as shown in FIG. 5. The dual chemical meter is maintained in a vertical position and in permanent flotation inside the liquid solution reservoir. The meter is also maintained in constant circulation inside the reservoir and as a result of the rocking motion with which the liquid solution enters the hollow body to slowly wash out the phosphorous chemical material impregnated in the crystallized sand, and then the correct amount of resulting mixture (13) is released throughout the reservoir, metering one part per million of temephos, which is enough to kill mosquito larvae and is innocuous to humans, as has been proven in the WHO/PAHO collaboration laboratory, which guaranteed the efficiency of mosquito larvae annihilation and the largest durability of temephos of at least 5 brands of temephos from 4 countries; the rocking motion is generated when the reservoir that contains the meter is filled, this creates "waves" in the liquid that falls in to the reservoir that create a rocking motion in the meter because the counterweight "pulls" the meter down and the floater "takes" it up but always maintaining a vertical position, this vertical position of the meter inside the reservoir and its permanent floating maintain the water pressure between the floater (4) and the bottom of the meter (14) so that it can inject the concentrated liquid solution resulting from the mixture between the liquid solution and the phosphorous chemical material impregnated in the crystallized and without diluting the chemical material, because it will always retain its granular form, and this way the residual temephos effect is sustained for a longer period, maintaining the water reservoirs free of mosquito larvae that can lead to fatal diseases such as hemorrhagic dengue fever.

PREFERRED EMBODIMENT OF THE INVENTION

A cylindrical device is shown with at least one perforation on one side and on the opposed part an upper perforation, both duly calibrated to meter in a controlled manner a liquid with temephos in an amount of one part per million, obtained by washing out the sand impregnated with a phosphorous chemical with the permanent rocking motion of the meter, this cylindrical device has a counterweight of clay with open pores between 3 and 5 micras impregnated with a phosphorous pesticide that can be removed to impregnate again with the phosphorous pesticide and again have a residual effect, a floater as shown in the figures, the meter body (1) is a light hollow body, which is previously obtained using a molding/blowing or rotational molding technique, which includes the perforations (2 and 3). Inside this body a counterweight (5) is placed in the bottom part and the amount of the phosphorous chemical material impregnated in crystallized sand (8) that will be used is introduced. In the upper part of the meter body (1) is a floater (4), which can be placed by threading, pressure or any other way that allows to keep it in fixed to the upper part of the meter body, depending on its physical characteristics.

CLAIMS

Having described my invention in a sufficient and clear way, I consider it to be a novelty and therefore claim as my exclusive property what is contained in the following clauses:

1. Dual chemical meter with crystallized sand impregnated with a phosphorous chemical that includes a hollow cylindrical body where the center of the bottom part is not flat but forms a hollow cylinder that extends down in the shape of a pendulum that in addition serves as a base to insert the counterweight with pressure and the counterweight also has the very important function to apply the residual part of temephos to1% when the sand has been washed out, another characteristic is that the base only covers half of the clay counterweight, this allows to remove it from its position by pushing the base from the bottom up to again impregnate phosphorous pesticide in its to continue having a residual effect, the upper part of the meter forms a neck with an end where a floater is placed, but this neck forms a snap-on thread that seals hermetically so that once the floater has been pressured into place it does not come out of its position but at the same time it facilitates the intentional removal of the floater to refill the meter with crystallized sand impregnated with phosphorous chemical product, in addition, the lower part of the neck has an end to prevent more than half of the floater from being inside the meter. The meter has at least one lower perforation aligned vertically and at least one perforation opposed to it at a larger height; where the lower portion has a clay counterweight with porosity for residual release and this porosity if between three and five micras impregnated with a phosphorous chemical and in the upper portion it has a floater.

2. Dual chemical meter, where as claimed in the previous clause, the hollow body that forms it is made of a light material of some polymer, such as polyethylene, polycarbonate, polyvinyl chloride or a similar material and can be cylindrical or any other geometric shape, where the interior or hollow space can house the phosphorous chemical material that impregnates a crystallized sand and when it enters into contact with a liquid it washes it out and meters one part per million of temephos.

3. Chemical meter, which as claimed in the first clause, has a clay counterweight with porosity between three and five micras or any other inert material that can be spherical or any other geometric shape.

4. Chemical meter, which as claimed in the first clause, has a spheric or any other geometric shape floater, made from any polymer, such as polyethylene, polycarbonate, polyvinyl chloride or any other material with similar characteristics that enables the flotation of the meter.

5. Chemical meter, which as claimed in the first clause, has a hollow cylindrical body where the

phosphorous chemical material impregnated in crystallized sand is placed, and where the cylinder's diameter is reduced in the bottom part creating a type of neck and in the lowest part the cylinder expands again to a diameter that is smaller than the diameter of the section where the soluble chemical material is contained, resulting in a cavity inside which the counterweight is placed. The hollow cylindrical meter has a snap-on spheric floater. The floater is kept in place due to a special L-shaped ribbed edge in the upper part that acts as a lock to prevent the floater from coming out of the meter, the floater is placed with pressure up to an end that is on the meter's neck so that it does not penetrate further into the meter. Once the floater has been locked it also serves to protect the chemical product from solar rays that could accelerate its degradation. In the bottom part of the cylindrical meter a duly centered space is formed that extends down to form a type of pendulum that holds a counterweight that is pressed into place to keep it in its base, with the characteristic that only half of the counterweight penetrates and it can be removed by pressing from the bottom up, this counterweight maintains the meter in a vertical position inside the liquid of the reservoir increasing the efficiency of the metering of the phosphorous chemical impregnated in crystallized sand, in addition this counterweight serves as the second form to apply temephos, that is, the residual or dual application.

SUMMARY

Chemical meter to wash out a phosphorous chemical material impregnated in crystallized sand in a liquid where the resulting mixture will be metered at one part per million in a container of the liquid that will be treated with temephos to eliminate mosquito larvae with includes at least two perforations, where at least one of them allows the liquid to enter the meter and the other allows the release of the substance resulting from the mixture of the phosphorous chemical material impregnated in crystallized sand and which when washed out applies a mixture of one part per million of temephos that eliminate mosquito larvae. The dual chemical meter has a functional feature due to its physical properties, which is that, inside the container with the liquid that will be metered, it has a rocking motion that results from the floater and the counterweight that constitute it, which results in a more efficient metering of the mixture obtained and therefore simplifies the process of treating a liquid contained in a container with a phosphorous chemical material impregnated in crystallized sand and that applies temephos in one part per million based on the WHO's specifications for innocuousness of the pesticide that eliminates mosquito larvae when applied in water for human use and consumption.