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Declarations under Rule 4.17:
— *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*
— *of inventorship (Rule 4.17(iv))*

Published:
— *with international search report*
— *with amended claims and statement*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

WO 2007/069796 A1

(54) **Title:** INSECTICIDAL COMPOSITION CONTAINING BORIC ACID

(57) **Abstract:** An insecticidal composition comprising boric acid 35-38%, petroleum jelly 24-29%, water 7-10%, glycerin 7.5-9.5%, sugar 7-10%, garlic powder 1-2.5%, The formulation that carries the active ingredient is comprised of an active ingredient, a emulsifying agent, a gelling agent, antifoaming agent, a moisturing agent, and a flavoring agent.

TITLE: INSECTICIDAL COMPOSITIONS

BACKGROUND OF THE INVENTION

Field of the Invention.

The invention relates to insecticidal composition, which are particularly suitable for handling during processing, packaging, transportation and storage. The invention specifically relates to insecticidal compositions with most or all the aforementioned desired characteristics and with long term effective pest control.

Discussion of Prior Art.

Crawling insects have a long history as a major problem to mankind. These insects have been controlled in many ways including the use of insecticidal composition. There are a number of attempts to prepare insecticidal compositions for control of such crawling insects. Considerable effort has been put to into the development of a long lasting insecticidal composition. However, there have many difficulties that have been experienced in producing an optimum insecticidal composition with 10 desired characteristics by the users.

The major requirement of any long lasting and effective insecticidal compositions is the chemical stability to ensure efficacy and uniform activity. However, safety must come high on the list of important attributes of a good insecticidal composition.

Other important attributes include worker exposure, safety for the Environment, including spills and container disposal issues. Most of these chemicals are applied under furniture and craves or cracks which occasionally come into contact with people. For formulation to be safe they need to be physically stable and this includes separation or breakdown of the product, which affects any of the other properties.

Another desirable property includes the ability to not leave any marks or stains on furniture or walls where it is applied. The other properties desirable for such formulations also include the ability to withstand low or high temperatures without affecting the loading of the active ingredient. This includes melting at high temperatures and crystallization during low temperatures. The formulations must be useable without excess forming or bad smells or odours, be compatible with

other commonly used pesticides and at the same time maintain the biochemical activity.

The insecticidal composition has to be able to be packaged in conventional containers or commonly known and used means of application. The formulation should be compatible with the means of containing and applying them. There is therefore the need to develop an insecticidal composition that has a specific formulation ratio and show the desirable characteristics in order to wipe out the entire population of these pests over a long period of time.

Many of the insecticidal compositions used today have quite a number of undesirable characteristics. Firstly many of them are made up with materials that when applied will always leave ugly marks or sports where they were applied. This is not a desire attribute to the users. The other problem of known convention and composition are made up of rough materials and desired means of application like the syringe applicator or tube with a long nozzle cannot be used to apply such compositions.

Other compositions are effective but are harmful to the environment or unsafe when exposed to workers or the people living in homes where such compositions are used.

An object of the instant invention is to provide an insecticidal composition that has most or all the aforementioned desired properties.
An object of the instant invention is to provide insecticidal compositions containing an active ingredients, most preferred active ingredients for purposes of this invention being Boric acid and having most or all the aforementioned desired characteristics or properties
needed in an insecticidal composition.

SUMMARY OF INVENTION

The insecticidal compositions according to the invention comprising a specific ratio of compounds, contained in a water soluble mixture comprising an active ingredient and solvent, and at least one gelling agent and at least one emulsifier, and at least one antifoaming agent, and at least one moistening agent, and at least one flavoring/baiting
agent to attract the crawling insect to consume the insecticidal composition.

An important feature of this instant invention relates to an insecticidal composition for use against insect pests and method therefore comprising an effective amount of active ingredient, preferred active ingredient for purposes of this instant invention being Boric acid.

Another feature of the instant invention is the ability of the insecticidal composition to be used and not to leave an ugly marks or spots on furniture or walls and is also effective for a long period of time.

Another feature of the instant invention is the ability of the insecticidal composition to be early applied through simple application by hand and also be able to be applied using
state of the art application methods like syringe and tube with pointed nozzles for domestic users.

Another feature of the instant invention is that the composition has no toxicity to workers handling it during its preparation and also does not have any danger to people who are exposed to the insecticidal composition.

Another feature of the instant invention is the fact that the insecticidal composition as claimed in this invention is environmental friendly and therefore do not cause any harm to the environment.

Still another aspect of this invention is a method of controlling insect pests by applying the insecticidal composition to affected areas and being able to work Effectively over along period of time.

Detailed Description of the Invention.

Many kinds of insecticidal compositions are presented in form of paste and other crude formulations like granules or pellets have presented a number of problems. These problems include but not limited to leaving behind messy residues after application, affect asthmatic patients and those who are allergic, is irritating to surface application and has foul smell.
An essential aspect of this invention is the development of an insecticidal composition devoid of all the above mentioned shortcomings and contains a water soluble solvent, active ingredient and at least one selling agent and at least one emulsifier and at least one flavoring agent and at least one moisturizer.

Boric acid is a white Solid, Odorless, and has a melting Point of 171%C.The density is1.435g/cm and has a Solubility of 5.6g in 100ml of water at 20'C; 63.5g/ at 30'C.Boric acid is stable under ambient conditions, has a vapor Pressure of kPa at 20'C,is non flammable and Hygroscopic above

Boric acid and its sodium salts have insecticidal properties and can be used in variety of sites, including sewage systems, outdoor residential areas and indoor sites such as homes, hospitals and commercial buildings.

Insecticidal Formulations of containing boric acid include aerosols, Liquid solutions, emulsifiable concentrates, granules, wettable powder, dusts, pellets/tablets, pastes baits etc.

Boric acid is often used as a relatively non-toxic insecticide for the control of the cockroaches, termites, fire ants, fleas and many other insects and is an active ingredient of many commercial insecticide formulations.

As an insecticide, boric acid acts as a stomach poison, affecting the insect's metabolism and protoplasma. Boric acid is generally known as a desiccant; in other words it kills by removing the moisture form the body of the pests, causing severe dehydration, which will affect electrolyte metabolism with the potential of metabolic acidosis.

Ingestion of boric acid causes insects deaths, three to ten days later, of starvation and dehydration. Due to its unique mode of action, insects do not develop resistance to borates. Boric acid/Borates are very effective against many crawling insects' pests including cockroaches, silverfish, larder beetles, carpenter ants and other woodborers as well as organisms causing wood decay.

Baits containing boric and food ingredients work on a simple principle, attract the cockroach with a promise of easy food; when it eats the food, it also ingests a poison.

For best results, clean, clean the area to be treated. Apply the paste with a stick; smear it on the surfaces in the corners of rooms, shelves, cupboards drawers, and other hidden dark places of the infested areas.

The Boric acid paste can be applied in domestic premises, food handling commercial establishments (stores, restaurants, factories, shops etc.) and also in Hospitals, Offices, Hotels and other public places. It can be applied under kitchen appliances, in electrical and office equipment. Cockroaches will usually die within seven days after application, in cases of severe infestation; a second application may be required after 14 days.

Boric acid naturally occurs in air, water (surface and ground water), soil and plants, including food crops. It enters the environment through weathering of rocks, volatilization from seawater and volcanic activity. Most boron compounds convert to boric acid in the environment, and boric acid is the boron compound of environmental significance. Boric acid is adsorbed to soil particles and aluminum and iron minerals.

Experiment 1

The efficacy of the above preparation was tested in five houses. The insecticidal composition was smeared on a flat surface – such as on a small piece of paper with approximately 5gm-10gm of the insecticide. It was then placed in the kitchen corners and other hidden spaces in four houses. The fifth house acted as a control. No insecticide was placed there. The cockroaches that died were young ones basically nymphs.

The results are shown in the following table: -

COCKROACHES DEAD

HOUSES	DAY 1-6	DAY 7-14
1	0	8
2	0	3
3	0	2
4	0	2
5 (Control)	0	0

The efficacy of the insecticide paste was tested in the laboratory. Ten (10) cockroaches were placed in a cage in which a filter paper smeared with 5gm-10gm

of the composition was kept. All the (10) cockroaches died on Day 7.No lethal dose (LD50) was observed as all the cockroaches died at the same time – day 7.No eggs were laid before the cockroaches died.

The above preparation is safe to use as a public Health pesticide against cockroaches. The insecticide is specific against cockroach "Blatania Orientalis" and "Blatta germanica"

The amount of active ingredient in the insecticidal composition of the invention is generally comprised between 35 and 37% of the total insecticidal composition.

The amount of emulsifier in the insecticidal composition of the invention is generally comprised between 7 and 10% of the total insecticidal composition

The amount of moisturizer in the insecticidal composition of the invention is generally comprised between 7 and 10% of the total insecticidal composition.

The amount of gelling agent in the insecticidal composition of the invention is generally comprised between 24 and 28 % of the total insecticidal composition..

The amount of flavoring agent in the insecticidal composition of the invention is generally comprised between 1.0 and 2.5 % of the total insecticidal composition.

A particular embodiment of the present invention is an insecticidal composition containing an active ingredient, preferably Boric acid and a solvent and at least one selling agent and at least one emulsifier and at least one flavoring agent.

Another particular embodiment of the present invention is an insecticidal composition according to any one of the previous embodiments wherein the solvent is any conventional solvent could be used preferred according to the present invention is water.

Another particulars embodiment of the present invention is an insecticidal composition according to any of the previous embodiments wherein the emulsifying agent is any conventional emulsifying agent that could be used the preferred agent according to the present invention is sucrose and glycerin.

Another particular embodiment of the present invention is an insecticidal composition according to any of the previous embodiment wherein the selling

agent is any of the conventional gelling agents; preferred for this present invention the gelling agent is petroleum jelly and milking jelly.

Another particular embodiment of the present invention is all insecticidal composition according to any of the previous embodiment wherein the flavoring agent is any of the conventional flavoring agents, preferred for this invention is garlic powder.

The following examples are given to illustrate the invention and some mode of carrying out the invention. The following examples are only the preferred embodiment for carrying out the present invention; however, it is not intended to restrict the invention to these particular examples. Any actions or activities that are in the spirit of the present invention are considered part of this invention.

Example 1

Stirring the following compounds in the ratios indicated bellow made a uniform mixture. The mixture was then heated to a temperature of 70 degrees centigrade.

Stearyl alcohol _____ 5 grams

Liquid paraffin _____ 5 grams
Petroleum jelly_____15 grams

Water _____ 5 grams

20 grams of Very fine Boric acid was passed through a 180 um sieve and then added to the molten ointment based mixture.

After cooling or solidifying the mixture 5 grams of glycerin and 5 grams sucrose were added and passed through a 180um sieve then the mixture was mixed Thoroughly and packaged.

The final mixture therefore was made up of the following compounds in the following ratios.

Stearyl alcohol _____ 5 grams

Petroleum jelly_____15 grams

Water _____ 5 grams

Boric acid _____ 20 grams

Glycerin _____ 5 grams

Sugar _____ 5 grams

Garlic powder_____ 1 grams

Example 2

The following compounds were mixed in the following ratios stirred thoroughly to form a uniform mixture. This mixture is not ointment based unlike example 1 which is ointment based. The gelling agent is milking jelly.

Boric acid _____ 13grams

Milking jelly_____ 10 grams

Glycerin _____ 6 grams

Sugar _____ 5 grams

Garlic powder_____ 1 grams

The Boric acid and sugar were passed through a 180um sieve then mixed thoroughly and package.

The insecticidal composition according to this invention acts by retarding the growth of the cockroach and inhibits the egg laying process. It kills the cockroach slowly due to retardation over a period of time. It is non-Irritant, Odorless and has a repelling effect on the cockroach population.

The composition was applied insect infested areas and the following results reported. The insecticidal composition as claimed in the present invention is preferred since once used it does not leave any spots or marks in the placed it is applied.

The insecticidal composition according to the present invention has smooth particles and can be applied into cracks, crevices in the walls or joints of furniture where the insects hide. This is a major advantage and is preferred by users who are in possession of state of the art like the syringe applicators. Ability to be applied on specific targets- through the use of a tube with a nozzle and syringe application.

The insecticidal composition according to the present invention has a longer shelf life as compared to those already known insecticidal composition. This is an added advantage and encourages longer storage and transportation times.

The insecticidal composition according to the present invention is not toxic and is not harmful to the environment.

The insecticidal composition according to the present invention can be made in different colors most preferred being the clear color and color of furniture or walls. The insecticidal composition according to the present invention is more hygienic than the known conventional insecticidal composition.

CLAIMS

1. An insecticidal composition comprising 35-38% boric acid, petroleum jelly 24-29%, water 7-10%, glycerin 7.5-9.5%, sugar 7-10%, garlic powder 1-2.5%,

2. A process of manufacturing an insecticidal composition comprising 35-38% boric acid, petroleum jelly 24-29%, water 7-10%, glycerin 7.5-9.5%, sugar 7-10%, garlic powder 1-2.5%,

3. A process for the manufacturing of insecticide as claimed in 1and 2 above whereas the active ingredient is boric acid.

4. An insecticide according to claim 1 above, which has all the desired characteristics of a good insecticidal composition.

5. A process for manufacture of insecticide as claimed in 1 and 2 where as the said insecticide has long term control of insects by removing moisture from the insect therefore causing death through dehydration and inhabiting the reproductive cycle of the insects

6. The insecticide according to claim one whereas the formulation that carries the active ingredients are comprised of an active ingredient, a emulsifying agent, a gelling agent, antifoaming agent, a moisturing agent, a binding agent and a flavoring agent.

7. An insecticide according to claim 1 which is easy to manufacture, is non-toxic, is no irritating to the skin, has no allergies, environmental friendly, leaves no messy residues when applied, has a longer shelf life and controls the insects for a longer period of time.

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CLAIMS

2. An insecticidal composition according to claim 1,wherein the percentage by weight of boric acid is 37%;

3. An insecticidal composition according to claim any of the preceding claims, for use in eradicating pests ,further comprising a emulsifying agent, a gelling agent, antifoaming agent, a moistening agent, a binding agent and a flavouring agent;

4. A Method of manufacturing an insecticidal composition, according to claim 1, for use in eradicating pests ,which comprises the steps of mixing together garlic powder,sugar,glycerine,water,petroleum jelly and boric acid and mixing the subsequent mixture;

5. A Method of manufacturing an insecticidal composition according to any of the preceding claims, for use in eradicating pests, in which method comprises the steps of mixing the emulsifying agent, a gelling agent, antifoaming agent, a moistening agent, a binding agent and a flavouring agent and mixing the subsequent mixture;

6. A Method of eradicating pests, which method comprises applying a composition according to any of the preceding claims to an area infested with pests.

APPLICANTS RESPONSE TO THE WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY OF PATENT APPLICATION NUMBER PCT/KE2006/000016 DATED 31st JANUARY 2007 IN THE NAME OF ANNA VASILIEVNA CHEPKONGA.

"Titled: Insecticidal Compositions"

The following is a citation of statements to amend the application in order to satisfy the requirement for inventive step as indicated by the written opinion of the international searching authority dated 31st January, 2007.

1. The insecticidal composition according to the current invention involves an inventive step since all the cited documents do not involve the use of, emulsifying agent, a gelling agent, antifoaming agent, a moistening agent, a binding agent and a flavouring agent; It is therefore not obvious to a person skilled in the art, not to mention the many advantages that are achieved are as a result of the inventive nature of the current innovation.

2. The stability of the insecticidal composition as claimed in the current invention is very good even when the temperatures are varied over a wide range within a very a very short time. This is an indication to confirm that the composition according to current invention is very useful in all different environmental condition. The compositions in all the six documents are not stable when heated while the insecticidal is stable when heated up to very temperatures. In addition, the present invention embodies surprising sensitive effect at concentration of 37% boric acid, a clear indication of an inventive step.

3. None of the cited documents in the search report discloses the use of a colouring agent as claimed in the current invention. The colouring can be varied depending on the choice of the user, different colours can be provided to suit the colour of furniture or environment the composition is to be applied. Further more the current invention is inventive since it not only useful to a professional pest control practitioner but is very domestic user friendly.

4. The use of the components mentioned in 1 and 3 above is not envisaged by the any of the documents cited in the search report. The elimination of the use of preservative not only saves on the cost of production but also increases the shelf life and efficacy of the current insecticidal composition. This is an inventive step since it is a crucial step forward towards ensuring that the cost of production is reduced tremendously reduced.

5. The above mentioned reasons are in support of the fact that the current invention involves an inventive step.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KE 2006/000016

A. CLASSIFICATION OF SUBJECT MATTER
IPC[8]: ***A01N 25/02*** (2007.01); ***A01N 59/14*** (2007.01); ***A01N 61/02*** (2007.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC[8]: A01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPI, EPODOC, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	RU 2186493 C2 (BREUSOV A.V. et al.) 10 August 2002 (10.08.2002) *abstract (WPI; Acc.No.: 2002-689043)* --	1
Y	JP 1216907 A (TAKIZAWA H.) 30 August 1989 (30.08.1989) *abstract (WPI; Acc.No.: 1989-295725)* ----	1

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 October 2006 (23.10.2006)	31 January 2007 (31.01.2007)

Name and mailing address of the ISA/ AT	Authorized officer
Austrian Patent Office Dresdner Straße 87, A-1200 Vienna	KRENN M.
Facsimile No. +43 / 1 / 534 24 / 535	Telephone No. +43 / 1 / 534 24 / 435

Continuation of first sheet

Continuation No. II:

Observations where certain claims were found unsearchable

(Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:

Claims Nos.: 2-7 because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

Claims 2,3 and 5 are directed to a process, but do not contain any process step. The product claims 4 and 7 do not contain any concrete technical features. Claim 6 is unclear in respect to the formulation "..formulation that carries the active ingredients are comprised of an active ingredient,...".

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/KE2006/000016

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
RU A 2186493		RU C2 2186493	2002-08-10
JP A 1216907		JP A 1216907	1989-08-30