PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :
A01N 25/00, 25/34, 43/62
A01N 63/00, 65/00

A1

(11) International Publication Number: WO 93/05651

(43) International Publication Date: 1 April 1993 (01.04.93)

(21) International Application Number: PCT/US92/07138

(22) International Filing Date: 25 August 1992 (25.08.92)

(30) Priority data:
765,337 25 September 1991 (25.09.91) US

(71) Applicant: THE CLOROX COMPANY [US/US]; P.O. Box 24305, Oakland, CA 94623-1305 (US).

(72) Inventors: WOLFE, James ; 7534 Ivy Court, Pleasanton, CA 94588 (US). LESIEWICZ, Don, L. ; 734 Old Raritan Road, Edison, NJ 08820 (US). MEHRA, Yashpal ; 46 Ponderosa Lane, Oldbridge, NJ 08857 (US). MARES, Joseph ; 1801 Englewood Drive, Valdosta, GA 31602 (US).

(74) Agents: PACINI, Harry, A. et al.; The Clorox Company, P.O. Box 24305, Oakland, CA 94623-1305 (US).

(81) Designated States: AU, BR, CA, CS, HU, JP, KR, PL, RO, RU, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE).

Published
With international search report.

(54) Title: COCKROACH BAIT FEEDING STIMULI

(57) Abstract

The insect bait composition in the present invention is useful for feeding stimuli to induce insects, especially cockroaches, to preferably feed upon said bait composition, which will stimulate insect feeding and successfully compete with other food sources in the environment, said stimulant bait composition having one or more protein sources derived from poultry liver, silkworm pupae and hydrogenated soy protein.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	**FI**	Finland	**MN**	Mongolia
AU	Australia	**FR**	France	**MR**	Mauritania
BB	Barbados	**GA**	Gabon	**MW**	Malawi
BE	Belgium	**GB**	United Kingdom	**NL**	Netherlands
BF	Burkina Faso	**GN**	Guinea	**NO**	Norway
BG	Bulgaria	**GR**	Greece	**NZ**	New Zealand
BJ	Benin	**HU**	Hungary	**PL**	Poland
BR	Brazil	**IE**	Ireland	**PT**	Portugal
CA	Canada	**IT**	Italy	**RO**	Romania
CF	Central African Republic	**JP**	Japan	**RU**	Russian Federation
CG	Congo	**KP**	Democratic People's Republic of Korea	**SD**	Sudan
CH	Switzerland			**SE**	Sweden
CI	Côte d'Ivoire	**KR**	Republic of Korea	**SK**	Slovak Republic
CM	Cameroon	**LI**	Liechtenstein	**SN**	Senegal
CS	Czechoslovakia	**LK**	Sri Lanka	**SU**	Soviet Union
CZ	Czech Republic	**LU**	Luxembourg	**TD**	Chad
DE	Germany	**MC**	Monaco	**TG**	Togo
DK	Denmark	**MG**	Madagascar	**UA**	Ukraine
ES	Spain	**ML**	Mali	**US**	United States of America

COCKROACH BAIT FEEDING STIMULI

The present invention relates to insect bait compositions useful for feeding stimuli to induce insects to preferably feed upon said bait composition. Therefore, when combined with an appropriate insecticide, the insect feeding upon the feeding stimuli containing compositions of the present invention will ingest the insecticide, which will then cause mortality of the insect.

More particularly, the present invention relates to insect bait compositions which are preferred feeding stimuli for cockroaches, wherein the bait stimuli will be consumed in high quantities by cockroaches under field conditions.

Background of the Invention

Insects, especially cockroaches, are omnivorous insects. These insects typically infest locations that contain sufficient food, moisture and shelter for survival. Cockroaches forage for food randomly and will examine a food prior to ingesting it. If the food does not contain ingredients that stimulate feeding of the insect, the cockroach may continue to forage for appropriate food sources. An avoidance or lack of feeding on a bait containing poisonous material may reduce the effectiveness of the insecticide against cockroaches under field conditions. Therefore, the purpose of this invention is to formulate an insect bait, in particular a cockroach bait, that will be preferentially consumed in high quantities by cockroaches under both laboratory and field conditions.

Research has shown that German cockroaches, for example, cannot detect food from a large distance, that is, greater than five to ten inches. As a result, German cockroaches forage for food primarily along baseboards and behind appliances. As cockroaches encounter a bait station, the insect will examine the bait using this mouth parts and antennae. If the bait meets the cockroach nutritional needs, they may consume the bait. Cockroaches can learn to return

SUBSTITUTE SHEET

to previously investigated food resources. Therefore, cockroach baits must be palatable enough to compete with other food sources in the environment to cause the insect to repeatedly visit the food resource and to ingest a lethal dose of toxicant applied thereto.

Discussion of the Prior Art

U.S. Pat. 4,353,907 relates to amidino hydrazones useful in insect and fire ant bait formulations and compositions in mixture with fatty acids and an edible oil.

U.S. Pat. 4,845,103 relates to solid, non-particulate, non-flowable, non-repellant insecticide bait compositions for household control of cockroaches, comprising a pentadienone hydrazone insecticide compound, a food attractant system and a binder. The food attractant system is a mixture of liquid food selected from molasses, corn syrup, maple syrup, honey and mixtures of two of these foods, and a solid food-oatmeal.

U.S. Pat. 4,657,912 relates to a granular bait composition for control of ants, employing a pyrimidinone derivative in combination with ground pupae of silkworm.

U.S. Pat. 4,990,514 relates to insecticide bait compositions for control of cockroaches comprising an insecticide compound, a food attractant system and a flowable binder. The food attractant used in the composition comprises a mixture of liquid food selected from molasses, corn syrup, maple syrup, honey and mixtures of two or more of these food substances.

Japanese Patent Application 61:106505 discloses insect attracting compositions for ants containing as attractant components a mixture of carbohydrate, protein and lipid. Preferably, the carbohydrate is fruit juice, honey,

sucrose, sugar, lactose, D-glucose, D-glucosamine, etc. Preferably, the composition is powdered, granular, solid, paste, liquid or gel. The protein source is an animal protein or vegetable protein, the lipid is a vegetable oil or animal oil. Various insect-controlling components are formulated with the attractant composition.

Summary of the Invention

The purpose of this invention is to formulate a cockroach bait that will be consumed in high quantities by cockroaches under either field or laboratory conditions. German cockroaches forage for resources (food and water). It is the object of the present invention to disclose and provide a bait formulation which will stimulate prolonged insect feeding, particularly in cockroaches, also provided for is a bait that will be consumed. Further, the stimulant bait formulation should not require coverage of the total surface or area where target organisms forage for food and water. It is therefore the primary object of the present invention to disclose and provide a preferred bait composition which will satisfy the cockroach nutritional needs and be consumed as a bait and at the same time palatable enough to compete with other food sources in the environment.

It is another object of the present invention to provide a stimulant bait composition which will stimulate cockroach feeding for long periods of time and into which an active insectcide can be formulated to produce a lethal dose of toxicant in the cockroach.

Other objects of the present invention will be apparent from the following detailed description.

Description of the Preferred Embodiment

The foregoing objects of the present invention may be accomplished by forming a novel mixture or solution of proteinaceous food material and certain

other ingredients, such as carbohydrates and various binding ingredients and carriers, to complete the composition.

The preferred embodiment of the present invention is a feeding stimulant composition comprising on a weight basis

from about 0% to about 50% proteinaceous food material as a feeding stimuli;

from about 0% to about 50% vegetable protein as a feeding stimuli/binder;

from about 0% to about 65% grain food as a feeding stimuli/binder;

from about 0% to about 30% carbohydrate as a feeding stimuli; and

from about 0% to about 40% lipid as a feeding stimuli/ binder.

An antimicrobial and/or antioxidant agent also may be included. These feeding/bait compositions have been found to be exceedingly effective for consumption by insects, such as cockroaches (*Blattella germanica, Periplaneta americana)* which typically infest locations that contain sufficient food, moisture and shelter for survival.

A more preferred embodiment of this invention is a bait composition comprising on a weight basis:

from about 0% to about 50% spray-dried poultry liver;

from about 0% to about 50% ground silkworm pupae;

from about 0% to about 50% hydrogenated soy protein;

from about 15% to about 65% ground oatmeal;

from about 0% to about 30% high fructose corn syrup; and

from about 0% to about 40% partially hydrogenated soybean oil.

Examples of other carriers are fish meal, powdered sugar, flour, rice bran oil, corn oil, soybean oil, corn syrup, glucose, krill and the like. The compositions

SUBSTITUTE SHEET

of the present invention are exceedingly effective for stimulating feeding in a variety of cockroach insects and subsequently when used with an insecticide controlling said cockroach population. Examples of other suitable carbohydrates include sucrose, maltose, arabinose, galactose, lactose, glucose, D-glucose, and D-glucosamine.

Silkworm pupae is a by-product of the silk industry obtained during the isolation of silk. Compositions of the invention may readily be prepared by grinding the dry pupae by conventional methods to maximize the yield of 10-60 mesh particles, which is preferred.

Spray drying methods are in the prior art and therefore no detailed exemplification need be given; however, in the interest of clarity, the following brief description of spray drying will be given. Spray drying is unique in that it dries a finely divided droplet by direct contact with the drying medium (usually air) in an extremely short retention time, 3 to about 30 seconds. This short contact time results in minimum heat degradation of the dried product. Drying from a particle generally takes place in two stages, the constant-rate and the falling rate period. The primary drying force is the temperature difference between the surrounding air and the temperature of the particle. This technique is particularly effective in preparing poultry liver useful in the present bait compositions.

Various other protein sources may be used in the present formulation. Animal digest is an acceptable source of animal protein coming from beef, poultry, fish and insect parts. Animal digest also includes internal organ parts obtained as by-products from slaughter house processing of such animals. These animal materials are preferably treated prior to use, as by spray drying, freeze drying and oven drying.

SUBSTITUTE SHEET

In addition, this development may be formulated with a novel emulsion carrier for the active insecticidal ingredient, preferably a pentadien-3-one substituted amidino hydrazone insecticide as described in U.S. Pat. 4,087,525, for example,

1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one, 4,5,6,7-tetrahydro-1H-1,3-diazepine-2-yl hydrazone;

1,5-(bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one,4,5,6,7-tetrahydro-1H-1,3-diazepine-2yl hydrazone hydrochloride;

1,5-bis(p-chlorophenyl)-1,4-pentadiene-3-one,4,5,6,7-tetrahydro-1H-1,3-diazepine-2-yl hydrazone hydroiodide; and

1,5-bis(p-chorophenyl)-1,4-pentadiene-3-one,4-phenyl-2-imidazolin-2-yl hydrazone hydriodide. The disclosure of U.S. Pat. 4,087,525 is incorporated herein by reference thereto, describing the use of these compounds as insecticides.

Other insecticides can be substituted for the substituted amidino hydrazone insecticide, particularly organophosphates, such as:

chlorpyrifos -- O,O-diethyl O-(3,5,6-trichloro-2-pyri-dinyl) phosphorothioate;

carbamates, such as propoxur - 2-(1-Methylethoxy) phenol methylcarbamate;

pyrethroids, such as phenothrin -- (3-phenoxyphenyl)- methyl 2,2-dimethyl 3-(2-methyl-1-propenyl) cyclopropane carboxylate;

chlorinated hydrocarbons;

fluoroaliphatic sulfonamides, such as sulfluramid - N-ethyl perfluorooctane sulfonamide;

boric acid;

insect growth regulators, such as hydroprene - ethyl (E,E)-3,7,11-trimethyl-2,4-dodecadienoate; and

microbially derived compounds, such as avermectin B_1 (a mixture of avermectins containing 80% aveermectin B_{1a} (5-O-dimethylavermectin

SUBSTITUTE SHEET

$A_1a(R=C_2H_5)$ and 20% B_1b (5-O-di-methyl-25-de(1 methylpropyl)-25-(1-methyl ethyl) avermectin $A_1a(R=CH_3)$.

The lipid phase contains soybean oil, a fatty acid, the active ingredient and an emulsifier and the aqueous phase contains a high fructose corn syrup. Other long chain fatty acids and various lipids would be acceptable substitutes or replacements for the fatty acid and lipid components identified herein.

Therefore, the present invention includes a method for controlling cockroaches comprising applying in the vicinity of their habitat or infested area an insecticidal bait composition comprising an insecticidally effective amount of a substituted amidino hydrazone insecticide or fatty acid salt thereof and the bait/feeding composition containing feed stimulants according to the present invention. Additional edible carriers such as fish meal, sugars, flour and the like may be added and the mixture blended until homogeneous.

Optionally, from about 0.0% to about 2.0% of an anti-microbial agent such as sorbic acid/potassium sulfate, Dowcil™ 200 (cis isomer of 1-(3-chloroallyl) 3,5,7-triaza-1-azonia-adamantane chloride), propyl paraben/methyl paraben (propyl p-hydroxybenzoate/methyl p-hydroxybenzoate), Captan (N-(trichloro-methylthio)-4-cycloehxane-1,2-dicarboximide), sodium silicate, sodium dehydro-acetate and sodium benzoate may be added to inhibit microorganism growth, or from about 0.0% to about 2.0% of an anti-oxidant such as tert-butyl hydro-quinone, n-propyl gallate, 3-tert-butyl-4-hydroxyanisol and butylated hydroxy toluene or mixtures thereof may be incorporated during the blending of the composition to improve the storage characteristics of the final compositions, as can other agents such as thickening agents and the like.

The insecticidal composition with the bait according to the present invention can also be present in the form of an aerosol, in which case a co-solvent

and a wetting agent are conveniently used, in addition to the propellant. The propellant is suitably a hydrochlorofluorocarbon alkane such as chloro difluoro methane, a non-halogenated alkane such as butane, and the like, carbon dioxide or nitrogen. The following types of formulations can be utilized to apply the formulated bait compositions with or without an effective amount of insecticidal agent: powders, dusts, granulates, solutions, suspensions, emulsions, emusifiable concentrates, pastes, foams, gels, fumigants, atomizing compositions, baits, and aerosols. The formulations of this invention can also be included in insect feeding stations such as bait trays.

The invention is further illustrated by the following non-limiting examples.

Procedure for Bait Compounding

Soybean oil (100 grams) (g), glycerylmonostearate (5 g), soy protein (58.5 g), and oleic acid (10 g) were mixed and heated to approximately 170°F until all solids had dissolved. Corn syrup (50 g) heated to 140°F was added to this and mixed to form an emulsion. Spray dried poultry liver (58.5 g), dried and ground silkworm pupae (58.5 g) and oatmeal (150 g) were added to the heated liquid and agitated until uniform. The finished solution was poured into small cups and cooled to room temperature.

TABLE I: FORMULATIONS TESTED

Ex. No.	Poultry Liver	Silkworm Pupae	Soy Protein	Oatmeal	Corn Syrup	Partially Hydrogenated Soybean Oil
1	35.00	3.00	0.00	30.00	10.00	10.00
2	5.83	5.84	5.83	47.50	10.00	20.00
3	17.50	17.50	0.00	30.00	10.00	20.00
4	0.00	0.00	17.50	47.50	10.00	20.00
5	0.00	0.00	35.00	30.00	10.00	20.00
6	11.67	11.66	11.67	30.00	10.00	20.00
7	17.50	0.00	0.00	47.50	10.00	20.00
8	0.00	35.00	0.00	30.00	10.00	20.00
9	0.00	17.50	17.50	30.00	10.00	20.00
10	17.50	0.00	17.50	30.00	10.00	20.00
11	0.00	17.50	0.00	47.50	10.00	20.00
12	0.00	0.00	0.00	65.00	10.00	20.00
13	35.00	0.00	0.00	30.00	15.00	20.00
14	0.00	25.00	0.00	30.00	0.00	40.00
15	15.00	0.00	0.00	30.00	0.00	40.00
16	12.50	17.50	0.00	30.00	15.00	20.00
17	10.00	0.00	0.00	30.00	30.00	20.00
18	35.00	0.00	0.00	30.00	30.00	0.00
19	17.50	17.50	0.00	30.00	30.00	0.00
20	0.00	35.00	0.00	30.00	10.00	20.00
21	7.50	17.50	0.00	30.00	0.00	40.00
22	35.00	0.00	0.00	30.00	0.00	30.00
23	0.00	35.00	0.00	30.00	30.00	0.00
24	10.00	0.00	0.00	30.00	15.00	40.00

Active ingredient target is 2% by weight. Therefore, the compositions of the cited bait formulations sum to 98%, with the remainder available for the addition of active ingredient.

Explanation of Formulations Without Active Ingredient

For the above feeding stimulant tests, the experimental baits did not contain active ingredients, since the consumption of active ingredient would have inhibited further insect feeding. The test length was set to 3 days for each formula to collect sufficient feeding data. Presence of an active ingredient would have increased variability by causing mortality in the insect population feeding on the bait formu- lation. Subsequent tests with the substituted amidino hydrazone active ingredient indicated that the insects fed upon the test baits containing active ingredient, notwithstanding the presence or absence of the active ingredient.

Explanation of Feeding Data

The feeding data were measured as weight loss of bait, relative to the mass of cockroaches in each container. The total mass of cockroaches used for each test could not be precisely controlled. A cockroach population of higher mass (more insects, higher proportion of adult insects) is expected to consume more bait than a smaller mass. In addition, consumption tests were run for three days. Therefore, the consumption of bait in each test was divided by three to report a standard, 1 day consumption figure.

The feeding data ratios were calculated as the ratio of feeding on the experimental bait to that of a standard bait base. The feeding data are presented in Table II.

TABLE II

Ex No.	Consumption Lab Strain (mg/g roach/day)	Consumption Field Strain (mg/g roach/day)	Ratio of Feeding (mg Formula per mg of Control) LAB STRAIN	Ratio of Feeding (mg Formula per mg of Control) FIELD STRAIN
1.0	13.15	13.67	1.48	3.87
2.0	6.24	7.07	0.59	2.42
3.0	7.56	10.17	0.92	2.63
4.0	2.79	3.91	0.23	0.62
5.0	6.53	5.45	0.59	0.81
6.0	8.12	9.40	0.84	3.00
7.0	10.75	9.27	0.91	1.81
8.0	4.17	3.97	0.42	0.97
9.0	2.09	2.32	0.17	0.41
10.0	9.44	11.06	0.88	1.77
11.0	3.54	4.03	0.30	0.57
12.0	0.11	5.50	0.01	0.85
13.0	22.28	21.53	3.18	5.69
14.0	9.68	16.91	0.52	5.20
15.0	12.64	19.52	0.89	3.22
16.0	21.07	24.40	2.43	5.93
17.0	28.48	18.41	5.28	5.60
18.0	33.41	20.50	5.22	3.97
19.0	32.93	31.34	5.68	11.80
20.0	17.24	20.21	1.22	8.30
21.0	14.72	29.74	1.41	7.80
22.0	16.52	21.91	1.29	5.22
23.0	26.88	19.36	3.46	4.77
24.0	26.55	26.73	3.59	6.85

The results of these experiments demonstrate the improved effectiveness as feeding stimuli of the compositions of this invention. Therefore, by utilizing the compositions of this invention, together with an insecticidally effective amount of insecticidal compound, the efficacy of the insecticidal compound can be increased where the mode of application of the insecticide depends upon the insect species feeding upon a source or bait containing the insecticide.

SUBSTITUTE SHEET

WHAT IS CLAIMED IS:

1. An insect bait feeding stimulant composition comprising on a weight basis:

from about 0% to about 50% of at least one proteinaceous food material;

from about 0% to about 50% of a vegetable protein;

from about 0% to about 65% of a grain food;

from about 0% to about 30% of a carbohydrate;

from about 0% to about 40% of a lipid; and

from about 0% to about 2.0% of an antimicrobial, an antioxidant agent or mixtures thereof.

2. The insect bait feeding stimulant composition according to Claim 1 wherein the proteinaceous food material is animal digest.

3. The insect bait feeding stimulant composition according to Claim 1 wherein the proteinaceous food material is animal protein.

4. The insect bait feeding stimulant composition according to Claim 1 wherein the proteinaceous food material is selected from the group consisting of spray dried poultry liver, ground silkworm pupae and combinations thereof; wherein said vegetable protein is soy protein; wherein said grain food is oatmeal; wherein said carbohydrate is corn syrup; and said lipid is soybean oil.

5. An insect bait composition comprising from about 0.5% to about 5% of a substituted amidino hydrazone or fatty acid salt thereof and feeding bait stimulant comprising on a weight basis:

from about 0% to about 50% of at least one proteinaceous food material;

from about 0% to about 50% of a vegetable protein;

from about 0% to about 65% of a grain food;

from about 0% to about 30% of a carbohydrate;

from about 0% to about 40% of a lipid; and

from about 0% to about 2.0% of an antimicrobial agent, an antioxidant or mixtures thereof.

6. The insect bait feeding stimulant composition according to Claim 4 wherein the proteinaceous food material is animal digest.

7. The insect bait feeding stimulant composition according to Claim 4 wherein the proteinaceous food material is animal protein.

8. The insecticidal bait composition according to Claim 4 wherein the proteinaceous food material is selected from the group consisting of spray dried poultry liver, ground silkworm pupae and combinations thereof; wherein said vegetable protein is soy protein; wherein said grain food is oat meal; wherein said carbohydrate is corn syrup; and said lipid is soybean oil.

9. The insect bait composition of Claim 4 wherein the substituted amidino hydrazoneis1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-pentadien-3-one,4,5,6,7-tetrahydro-1H-1,3-diazepine-2-yl hydrazone.

10. The method of combatting cockroaches comprising application in the vicinity of their habitat a bait feeding stimulant composition comprising an insecticidally effective amount of a substituted amidino hydrazone or fatty acid salt thereof and an insect bait feeding stimulant composition comprising on a weight basis:

from about 0% to about 50% of at least one proteinaceous food material;

from about 0% to about 50% of a vegetable protein;

from about 0% to about 65% of a grain food;

from about 0% to about 30% of a carbohydrate;

from about 0% to about 40% of a lipid; and

from about 0% to about 2.0% of an antimicrobial agent, an antioxidant or mixtures thereof.

11. The method of Claim 9 wherein the proteinaceous food material is animal ingest.

12. The method of Claim 9 wherein the proteinaceous food material is animal protein.

13. The method of Claim 9 wherein the proteinaceous food material is selected from the group consisting of spray dried poultry liver, ground silkworm pupae and combinations thereof; wherein said vegetable protein is soy protein; wherein said grain food is oat meal; wherein said carbohydrate is corn syrup; and said lipid is soybean oil.

14. The method of Claim 9 wherein the substituted amidino hydrazone is 1,5-bis(α,α,α-trifluoro-p-tolyl)-1,4-penadien-3-one-4,5,6,7-tetrahydro-1H-1,3-diazepine-2-yl hydrazone.

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 92/07138

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: A 01 N 25/00, 25/34, 43/62, 63/00, 65/00

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	A 01 N

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
X	US, A, 4087525 (J. B. LOVELL) 2 May 1978, see column 3, line 40 - line 50; column 13 - column 14, example II; the claims	1-13
X	US, A, 4990514 (F. J. BRUEY) 5 February 1991, see column 1, line 7 - line 13; the claims	1-13
X	Patent Abstracts of Japan, Vol 10, No 287, C375, abstract of JP 61-106505, publ 1986-05-24 EARTH CHEM CORP LTD et al.	1-13

* Special categories of cited documents:[10]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document 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

"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

IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
5th November 1992	01 DEC 1992
International Searching Authority	**Signature of Authorized Officer**
EUROPEAN PATENT OFFICE	Gerd Wranne

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X	US, A, 4657912 (M. SUZUKI ET AL.) 14 April 1987, see column 1, line 41 - line 65; the claims	1-13
X	US, A, 4845103 (L. SPAULDING ET AL.) 4 July 1989, see column 2, line 11 - line 38; column 2, line 49 - line 68; column 3, line 33 - line 43; the claims	1-13
X	EP, A2, 0295442 (AMERICAN CYANAMID COMPANY) 21 December 1988, see page 3, line 14 - page 4, line 38; the claims	1-13
X	AU, B, 576034 (R & C PRODUCTS PTY. LIMITED) 19 June 1986, see page 4, line 12, (e); the claims	1-13
X	Patent Abstracts of Japan, Vol 6, No 180, C125, abstract of JP 57- 95904, publ 1982-06-15 RIKEN KOURIYOU KOGYO K.K. et al.	1-13
X	DE, A1, 2928204 (AIRWICK AG) 24 January 1980, see claims 1, 3, 6, 7	1-13
X	WO, A1, 9112722 (HENKEL KOMMANDITGESELLSCHAFT AUF AKTIEN) 5 September 1991, see the claims	1-13
X	DE, A1, 2408001 (HENKEL & CIE GMBH) 28 August 1975, see the claims	1-13

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
X	US, A, 4320130 (R. B. BALSLEY ET AL.) 16 March 1982, see column 2, line 11 - line 15; column 2, line 35 - line 55; the claims	1-13
X	EP, A1, 0430633 (THE CLOROX COMPANY) 5 June 1991, see the claims; page 2, lines 21-22, lines 38-50; page 3, lines 28-30	1-13
X	EP, A1, 0430634 (THE CLOROX COMPANY) 5 June 1991, see the claims; page 2, lines 10-12, lines 29-39	1-13

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. PCT/US 92/07138

SA 63825

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 30/09/92
The European Patent office is in no way liable for theseparticulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
US-A- 4087525	02/05/78	GB-A-	1591121	17/06/81
US-A- 4990514	05/02/91	AU-B-	608597	11/04/91
		AU-D-	1514388	27/10/88
		EP-A-	0289756	09/11/88
US-A- 4657912	14/04/87	AU-B-	581306	16/02/89
		AU-D-	5606786	23/10/86
		CA-A-	1261737	26/09/89
		EP-A-B-	0202435	26/11/86
		JP-A-	61251602	08/11/86
US-A- 4845103	04/07/89	NONE		
EP-A2- 0295442	21/12/88	AU-B-	609143	26/04/91
		AU-D-	1768588	22/12/88
AU-B- 576034	19/06/86	AU-D-	5087585	19/06/86
DE-A1- 2928204	24/01/80	FR-A-	2430722	08/02/80
		JP-A-	55015465	02/02/80
		LU-A-	79981	14/02/80
WO-A1- 9112722	05/09/91	DE-A-	4005628	29/08/91
DE-A1- 2408001	28/08/75	AT-B-	341825	27/02/78
		BE-A-	825701	19/08/75
		CH-A-	593017	15/11/77
		FR-A-B-	2260952	12/09/75
		GB-A-	1494251	07/12/77
		NL-A-	7501432	22/08/75
US-A- 4320130	16/03/82	NONE		
EP-A1- 0430633	05/06/91	AU-D-	6694090	04/07/91
		CA-A-	2030708	28/05/91
		JP-A-	3176402	31/07/91
		US-A-	5126139	30/06/92
EP-A1- 0430634	05/06/91	AU-B-	626477	30/07/92
		AU-D-	6694190	30/05/91
		CA-A-	2030706	28/05/91
		JP-A-	3176401	31/07/91
		US-A-	5021237	04/06/91