

INSECT AND PEST TRAP

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to traps for crawling insects and more particularly to an improved trap for use in pest control by which a crawling insect is trapped and/or killed and is especially useful for trapping and/or killing indigenous insects, pests, bugs and the like such as various species of cockroaches.

2.. Description of the Prior Art

It is well known that certain types of crawling vermin present a health problem. For example, cockroaches of which there are a wide variety, estimated to be about 3,500 species in the world and some 58 species in North America, tend to live in sewers or drains or in virtually any location in which food or food scraps are available for the pest to feed upon. It is known that roaches can cause health problems with saliva and excrement being left on food items and in food areas. They also leave spent exoskeleton (skin that is shed as they grow) and secretions which may trigger allergic reactions.

Roaches thrive in warm and moist climates. Typically, roaches are present in heated buildings in populated areas especially in large cities of North America and Europe. Large roach populations are known to be present in the kitchens of restaurants, even the most prestigious and those which take great care to control the crawling pests.

There are a number of species of roaches in North America, the largest being the American roach which may reach 1 to 1½ inches in length. The next largest is the oriental roach (waterbug) which may reach sizes of 1 to 1½ of an inch. The next size is the German roach which may reach lengths of ¾ of an inch, followed by the brown-banded roach which can reach ½ inch size.

Most people have a squeamish reaction to crawling vermin such as roaches or other crawling insects such as water bugs or beetles. Such a reaction only heightens the anxiety and desire to eliminate such crawling insects, especially roaches, since there is a tendency to associate the presence of roaches with the presence of a local dirty environment and unsanitary conditions. It is not always the case that the presence of roaches, for example, signifies unsanitary conditions. Roaches are indigenous in some regions and are known to migrate from one location to another and to remain out of sight until it becomes dark. The result is that the presence of even a single roach causes the conscientious to take all reasonable steps to eliminate roaches.

A variety of different approaches have been used in the past to eliminate or control roach infestations. Some involve spraying with chemical pesticides which tend to be more damaging to the environment than the benefit which they provide in the elimination of roaches. Others are totally inadequate to solve the problem. It is also the case that the different species have somewhat different behavior.

For example, German roaches tend to aggregate in dark places, such as in an around refrigerators, dishwashers, stoves, washers, driers and water heaters. This species of roach is also known to aggregate in cracks and crevices simply because their feces contain a pheromone. The brown-banded roach is more likely to be found in hotels, furniture, closets and the like and avoid light. They feed on starch materials and non-food materials such as nylon etc. They tend to live in electrical appliances such as TV sets, stereo sets, radios and toasters.

Various approaches have been taken to control or eliminate roaches. One approach is the use of baited traps, the use of sprays and powders and various chemicals and pesticides. Other controls are also known, for example, U.S. Pat. No. 4,423,564 of Jan. 3, 1984 describes a method and apparatus for trapping and killing pests in which an attractant is used to lure the pests to a surface which is periodically pulsed electrically to dislodge the pest onto a sticky insert.

It is also known from the literature that insects carry an electrostatic charge. It is this electrostatic gradient across the outside of the cuticle of pest, usually a positive charge, which allows it to walk up vertical smooth walls or inclines surfaces, see for example, Beament, J. W. L. in *Nature Lond.* Vol. 191, 1061, pp 217-221. If the electrostatic charge is neutralized, the pest becomes destabilized and can no longer traverse smooth curved or inclined surfaces. Thus, in International Application Number PCT/GB93/01442, published on Jan. 20, 1994, there is disclosed the use of a positively charged powder which becomes attached to the feet and cuticle of a crawling insect to neutralize the electrostatic charge resulting in destabilizing the insect which then falls into a capture area. The design of the trap there described is diagrammatic at best and lacks some of the features needed for the trap to be totally effective in a commercial application.

Thus, one object of this invention is to provide an improved and effective trap for crawling insects which can both attract the insects and pests and trap and/or kill them.

Another object of this invention is to provide an improved trap for use with cockroaches which will attract and trap and/or kill the roaches without presenting an environmental problem.

A further object of this invention is to provide an improved trap which can trap and/or kill roaches of various sizes, especially as may be encountered in commercial installations such as restaurants and the like.

Yet another object of this invention is to provide an effective crawling insect trap which may be easily maintained, which is environmentally benign and which is effective as a device to control or markedly reduce crawling pests, such as roaches, in a particular area.

SUMMARY OF THE INVENTION

The above and other objects are achieved in accordance with the present invention by an improved insect trap for roaches and the like in which a trap plate is used, in cooperation with a trap housing and insect basin located in the base of the trap to retain insects in the trap once they have been lured into the trap by an attractant.

In a preferred form, the trap is composed of basically three parts, a lower housing which is of relatively low profile, a removable top lid and a trap plate supported within the lower housing. For reasons which will become apparent, the parts of the trap are made of nonconductive material so that the trap plate can retain an electrostatic charge. The top plate is charged electrostatically, as will be described, so as to retain electrostatically a powder which is attracted from the trap plate to the insect or vermin so as to neutralize the electrostatic charge on the feet or cuticle of the insect. With this charge on the insect's feet-cuticle effectively neutralized, the insect is incapable of traversing curved surfaces or inclined surfaces and effectively becomes destabilized.

The top lid protects the electrostatic charge on the trap plate from "leaking off" as the result of excess moisture thus enabling the trap plate to hold its charge and retain the