

A SUCTION APPARATUS FOR COLLECTING
MOSQUITOES AND OTHER INSECTS¹

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Entomologists, parasitologists and other biologists frequently must handle large numbers of live insects. Mouth aspirators of various kinds have been developed and used for this purpose, but their use may injure the health of the operator through the inhalation of dust, insect scales, insect bristles, bacteria, and viruses, all of which can cause bronchial irritation or other illness. An apparatus is described which is similar in principle to those described by Bailey (1966) and Carver

(1967) but which embodies differences in design that allow for the handling of insects without damage and that eliminate the health hazard.

DESCRIPTION. The apparatus (Figs. 1 and 2) is a modification of commercially available, portable, battery driven, hand vacuum cleaners designed for removing dust and dirt from clothes and car seats.

The vacuum in this type of cleaner is produced by high speed rotation of a four-bladed plastic propeller driven by a 3-volt electric motor powered by two 1.5-volt dry-cell flashlight batteries.

The vacuum cleaner was modified by removing the brushes and substituting a case, 180 x 40 x 37 mm., made from 3 mm. thick acrylic plastic (Fig. 1(2) and Fig. 2(2)). A plastic plate (Fig. 1(5) cross-section C-D) cut to fit the head of the vacuum cleaner was attached to one end

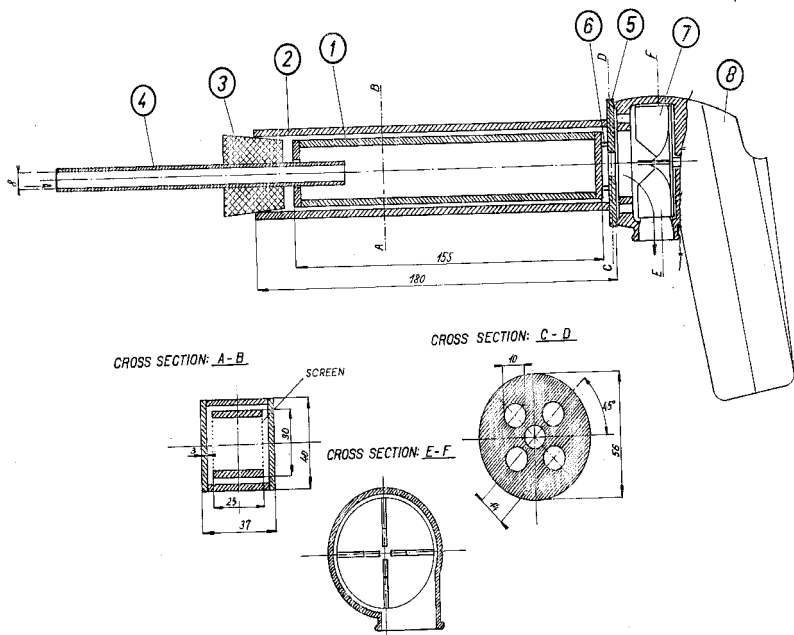


FIG. 1.—Details of a suction apparatus for use in live-trapping large numbers of mosquitoes or other small insects. (1) Holding cage, (2) plastic case, (3) rubber stopper, (4) 9 mm. glass tubing, (5) plastic plate, (6) spacers, (7) propeller, (8) body of vacuum cleaner. (All measurements are in millimeters.)

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of the case. In this plate five holes were drilled and two spacers, each 3 x 3 x 3 mm., were attached to the head of the vacuum cleaner. The front end of the case was fitted with a rubber stopper (Fig. 1(3) and Fig. 2(1)) with a suitable length of glass tubing 9 mm. in diameter through its center.

Holding cages (Fig. 2(4)), each 155 x 25 x 30 mm., were fitted into the case (Fig. 1(1)). The tops, bottoms and ends of these cages were made of 3-mm. acrylic plastic and the walls of nylon and heavy plastic screening. A 9-mm. hole was drilled at one end of the holding cage for the glass tubing (Fig. 1(4)).

OPERATION. When the vacuum cleaner is turned on, air is drawn through the glass tube and the holding cage, through the screened walls,

ADVANTAGES. The advantages of the apparatus are:

1. The air current is strong enough to draw mosquitoes into the holding cages without damaging them.
2. Holding cages can be changed easily.
3. Health hazard to worker is reduced.
4. Its efficiency is five times that of mouth aspirators.
5. It is portable and light.

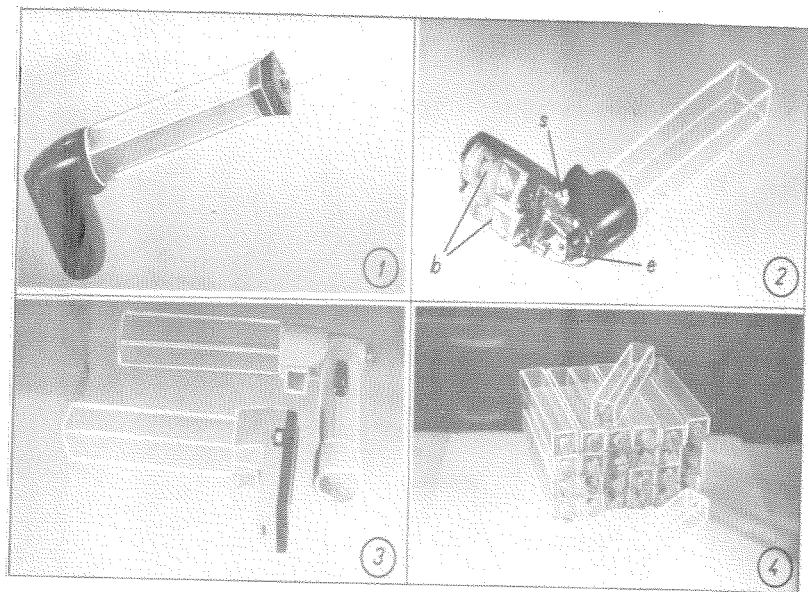


FIG. 2.—Suction apparatus for obtaining live mosquitoes and other insects. (1) Completely assembled; (2) plastic case attached to vacuum cleaner, (b) cover removed to show batteries, (c) motor, (s) switch; (3) vacuum cleaners of other makes with plastic case attached; (4) plastic holding cages.

past the bottom of the holding cage and out through the head of the vacuum cleaner.

Resting insects are sucked through the glass tubing into the holding cages where they are stopped by the screened walls. The air current is strong enough to suck in resting mosquitoes from a distance of 5 to 25 mm. without damage. When the desired numbers of mosquitoes are in the holding cage, it is removed from the case and corked (Fig. 2(4)). An empty cage is substituted. Cages of this type were first used by the Department of Entomology, University of Illinois, and were found to be very satisfactory for handling mosquitoes because specimens could be counted readily in them, they were easy to make, and they could be stacked in little space.

6. Energy source is commercially available dry cell batteries.

7. It is suitable for live-trapping a variety of small insects.

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