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AN APPARATUS FOR HAND-PICKING MINERAL GRAINS

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Separation of pure samples of finely powdered (-50 to +200 mesh, A.S.T.M.) minerals from a mixture involves the tedious process of hand-picking under a binocular microscope. The apparatus described below (Fig. 1) makes use of a soft plastic water-pistol as a suction device for collecting grains through an intravenous needle and polyethylene tubing into a glass vial. Both hands are used in the operation, which consists of segregating grains with a needle held in one hand and collecting them with the apparatus held in the other. This speeds up the process and lessens the strain inevitable in conventional hand-picking procedures.

MAKING THE APPARATUS

The following components, all of which are readily available, are required to make up the apparatus: (1) a soft plastic toy water-pistol, or alternatively a polyethylene bottle used for nasal sprays, (2) an intravenous needle, 18 or 19 gauge and two inches long, (3) a 3-inch length of polyethylene tubing with a 0.1 inch bore, commonly found in polyethylene wash bottles, (4) a small glass vial with hard plastic cap, and (5) a hard rubber check valve of the type used in rubber pressure or vacuum bulbs.

Two holes with diameters slightly less than those of the rubber valve at A and the plastic cap of the vial at B (Fig. 1) are punched into the water-pistol. The holes can easily be made with the tip of a glass rod of suitable diameter. Two holes are drilled into the plastic cap of the vial (C); the larger to take the polyethylene tubing, and the smaller to allow for the evacuation of air from the vial when using the apparatus. The hub of the intravenous needle is cut off, and the pointed end ground to a 45° angle with a narrow sharp tip.

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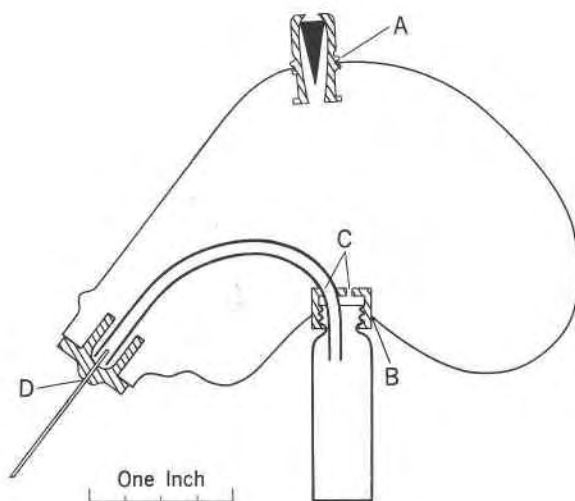


FIG. 1. Mineral-picking apparatus.

The cut end of the intravenous needle is inserted into the fine bore in the cap of the water-pistol at D, and the plastic tube supplied with the pistol replaced by polyethylene tubing, which has proved more satisfactory. Adhesive tape should be wound around the polyethylene tubing to ensure the necessary tight fit. The other end of the tubing is inserted tightly into the larger hole in the plastic cap of the vial, which is then mounted in the hole in the pistol at B. The valve is inserted into the hole at A.

PROCEDURE FOR USING THE APPARATUS

Mineral grains are spread on a glass plate under a binocular microscope. A few grains are segregated with a needle held in one hand. Instead of the conventional straight-tipped needle, the writer prefers one with a hooked tip, easily made by grinding a needle of soft metal that will bend without breaking. The mineral-picking apparatus is held with the other hand (Fig. 2), and pressed with the thumb to expel air through the valve. The grains may then be sucked in by releasing the thumb pressure.

If a check valve is not available, a glass tube can be used instead, but to create the vacuum necessary to suck in the grains, the tube must be closed with the index finger after expelling air, and the thumb pressure released slowly. The co-ordination of the finger and thumb can be acquired easily with some practice.

The water-pistol is available in several colors and in picking two or more minerals from a mixture, different colored pistols may be used. The



FIG. 2. Mineral-picking apparatus in use.

apparatus is inexpensive, easy to make, and has proved very useful in separating pure concentrates of zircons for age determinations.

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