

# TECHNICAL NOTE

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## A Simple Trace Evidence Trap for the Collection of Vacuum Sweepings

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**REFERENCE:** Petraco, N., "A Simple Trace Evidence Trap for the Collection of Vacuum Sweepings," *Journal of Forensic Sciences*, JFSCA, Vol. 32, No. 5, Sept. 1987, pp. 1422-1425.

**ABSTRACT:** The design of a simple vacuum sweepings trap for use in a portable Dustbuster® vacuum is presented. The device allows for the preliminary sorting of the various types of particulate matter at the time of their collection. This trap has proven to be of value in forensic science cases that involve trace evidence.

**KEYWORDS:** criminalistics, trace evidence, vacuum cleaners

One of the established procedures for the collection of trace evidence is the vacuum sweepings method [1,2]. A recent article discussed briefly some pros and cons of this type of evidence retrieval [3]. Although many forensic scientists continue to avoid collecting vacuum sweepings, at times, vacuum sweepings yield vital investigatory information. One disadvantage of the vacuum sweeping method now in current use is that the primary trap device used collects all the various items of trace evidence in a single chamber, thereby mixing all the trace evidence, and making it necessary to sort out the various types of trace evidence with a stereomicroscope [4]. To help solve this problem, and to make the task of collecting vacuum sweepings more attractive, a simple device which facilitates the collection and preliminary sorting of trace evidence was developed and is presented in this paper.

### Method and Materials

A piece of aluminum or stainless steel (size 20 mesh) screening (120 by 130 mm) is cut and folded lengthwise, in half, into a small basket. Common aluminum storm window screening could be used for this purpose. The mouth of the basket is 80 mm wide and 40 mm high. The sides of the basket are fastened with staples or small rivets. One piece of Velcro® (20 mm square) is attached, with its nap side facing towards the metal mesh, to each inside edge of the basket's opening (see Fig. 1a). Next, sheets of Whatman® No. 1 filter paper (115 by 120 mm) are cut from larger sheets. A Dustbuster® vacuum filter bag is then obtained and cut from its plastic support. Finally, a 140-mm-long by 20-mm-wide strip of Velcro is obtained.

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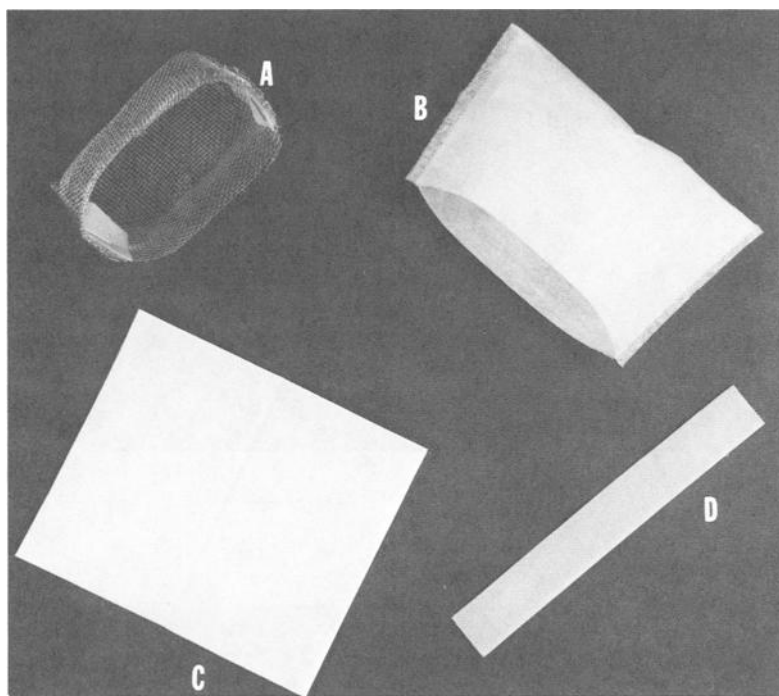


FIG. 1—All the items necessary for constructing the DTET unit: (a) metal basket, (b) vacuum filter bag with its plastic support removed, (c) filter paper, and (d) Velcro strip.

Figure 1 shows all the materials needed for the construction of the differential trace evidence trap (DTET) device.

One piece of filter paper is folded lengthwise, in half, and placed, folded end first, into the vacuum bag. Next, the metal basket is inserted into the vacuum bag, making sure the basket is surrounded by the filter paper. Finally, the strip of Velcro is placed lengthwise across the back and sides of the basket with its nap facing towards the mouth of the trap device. The Velcro strip is attached to the sides of the basket with the Velcro tabs (see Fig. 2).

The trap is then inserted as far as possible, into the nozzle end of a portable Dustbuster Plus® vacuum, making certain the trap device does not interfere with the free movement of the nozzle's rubber septum as shown in Fig. 3. The DTET unit will hold securely in the nozzle end because of the flexible, springlike nature of the metal basket. A filter bag which is normally used in the Dustbuster vacuum is also inserted into the nozzle, in the usual manner. The nozzle is then attached to the main portion of the Dustbuster Plus vacuum in the prescribed fashion. The vacuum unit is then used in the directed manner. After use, the nosepiece is removed from the vacuum unit and held (nose end up) while the filter bag and trap device are both removed. The DTET unit is then disassembled starting with the Velcro strip and working outward towards the vacuum bag. Each type of trace evidence collected is removed from the trap's components and placed in the appropriate evidence containers.

### Results and Discussion

When an item of physical evidence is vacuumed, the DTET unit sorts the various types of trace evidence as follows. Hairs and fibers tend to attach themselves to the nap of the Velcro strip. Large pieces of paper, wood, metal, minerals, as well as fragments of glass, paint,

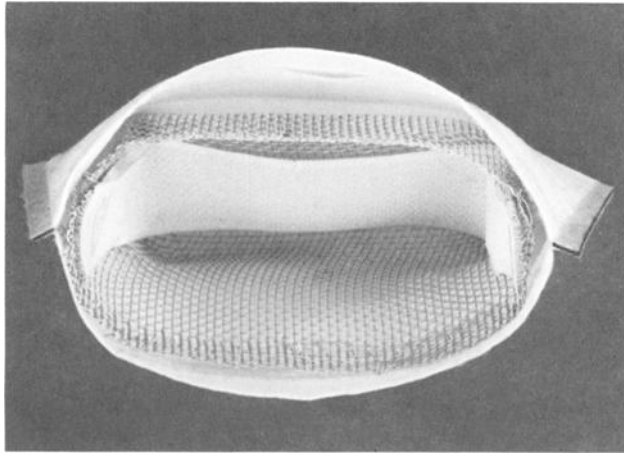


FIG. 2—The assembled DTET unit.

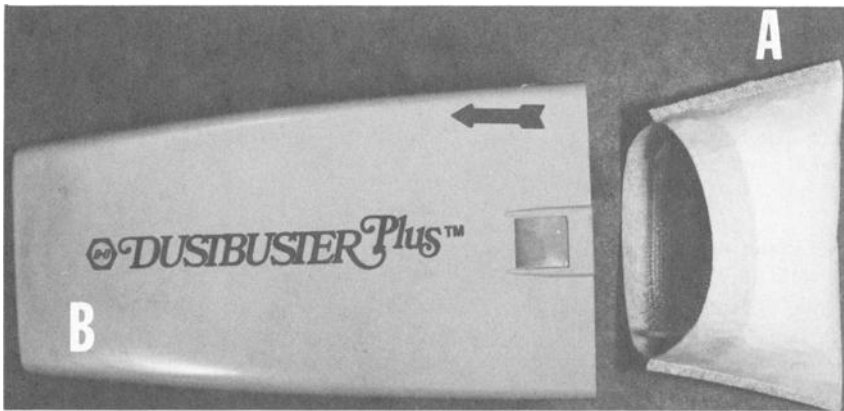


FIG. 3—The DTET unit (a) is inserted into the vacuum nozzle (b) in the direction of the arrow.

plant matter, and so forth are trapped in the metal basket. Soil, pollen, and smaller fragments and lengths of various particulates are collected by the filter paper. The Dustbuster vacuum bag acts as a final trap preventing the loss of any trace evidence.

This device coupled with the small, rechargeable, portable vacuum provides the forensic scientist with a fast, easy, and inexpensive way to collect and sort vacuum sweepings. The DTET unit is inexpensive and easy to construct. All of its components are readily available, and except for the filter paper, reusable. After use, the Velcro strip, basket, and vacuum bag are simply washed with water and air-dried before reassembly and reuse.

### Conclusion

This device has proven to be an efficient and effective way to collect and sort vacuum sweepings in trace evidence casework. It is easy and inexpensive to build, and quite simple to

use. It is the sincere hope of the author that this device will make the tedious task of collecting and sorting vacuum sweepings somewhat easier.

### References

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