Fritted Disc Funnels and Tapered Stainless Steel Tubes and Stoppers for Use in Pesticide Residue Analysis

by ISER LEVI and T. W. NOWICKI
Grain Research Laboratory
Canadian Grain Commission
Winnipeg, Canada

In a previous paper Levi and Nowicki(1972)showed that teflon gaskets after prolonged use, and other types of gaskets in blender-extractor apparatus may give interfering GLC peaks in pesticide residue analysis of wheat and barley. They also showed that Whatman 2V and 42 filter paper give interfering peaks in residue analysis.

This paper describes apparatus that eliminate interfering peaks from these sources in methods of pesticide residue analysis.

The authors designed a fritted disc funnel for use in filtering pesticide residue extractions, instead of using a funnel with filter paper. This is a 4" short stemmed 60° pyrex funnel fitted with a 50 mm. dia. medium porosity fritted disc, 5 mm. thick and annealed 43 mm. from the top of the funnel. This fritted funnel requires suction. The fritted funnels were made by Scientific Glass Inc., Bloomfield, N.J.

For greater rapidity, 12 funnels are set into 12 filtering flasks through hollow polyethylene stoppers. The flasks are connected to a 12 place manifold and suction is supplied by a water aspirator. Filtering pesticide residue extractions through fritted disc funnels with suction is as rapid as filtering through filter paper. The filtrate is water-clear. Injections of concentrated hexane washings of fritted disc funnels give chromatograms showing no peaks.

To eliminate interfering peaks caused by teflon gaskets after prolonged use and other material gaskets in extractor-blender apparatus, an all stainless steel tapered tube and stopper assembly was designed. The 60 ml. tube and stopper assemblies were made by Standard Manufacturers Ltd., Winnipeg, Manitoba, to our specifications. The tapered tube, stopper, and springs to hold the stopper, are illustrated in Fig. 1. A schematic drawing of the tube and stopper is shown in Fig. 2. Each tube and corresponding stopper is numbered for greater accuracy of fit and for ease of assembly.

Bulletin of Environmental Contamination & Toxicology,
Vol. 9, No. 1, © 1973 by Springer-Verlag New York Inc.

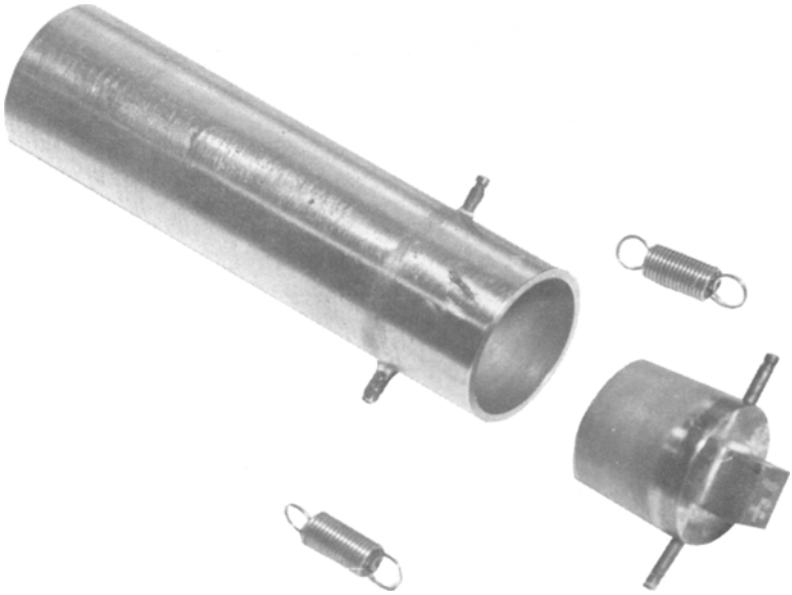

Fig. 1 Stainless steel tube and stopper, and springs.

A wrench to manipulate the springs on and off is shown in Fig. 3.

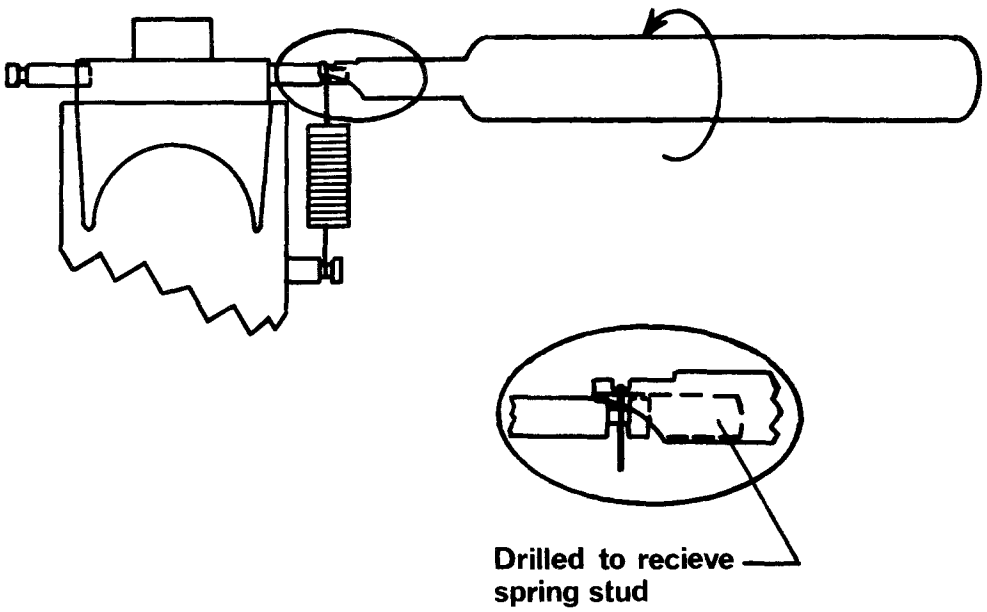

Fig. 3 Wrench

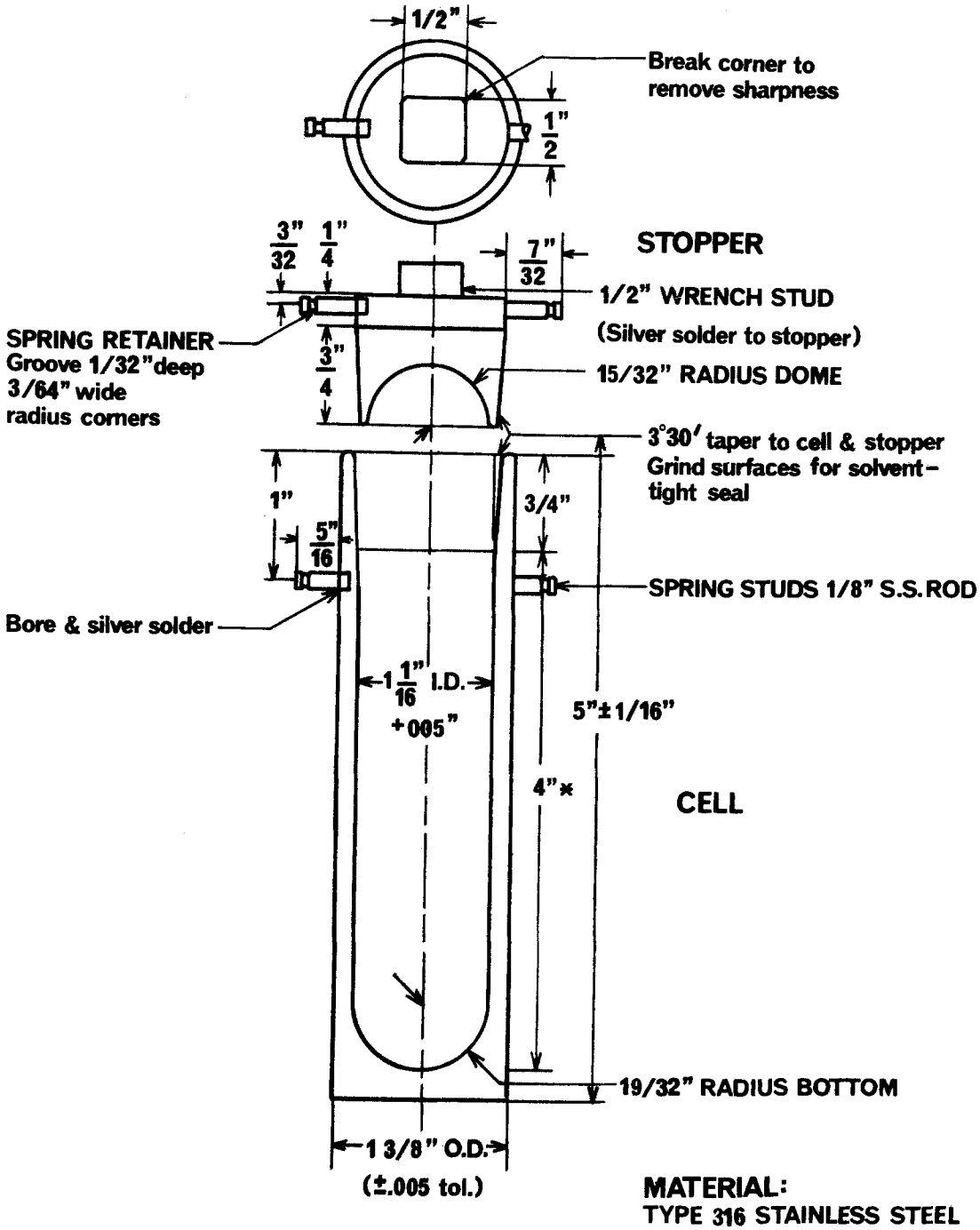

Fig. 2 Schematic drawing of stainless steel tube and stopper.

After daily use for six months the fritted disc funnels continue to give rapid filtration and clear filtrates. Similarly, after six months of daily use the tapered tube assemblies give complete satisfaction. Interfering GLC peaks from these two sources of error have been eliminated from pesticide residue analysis in our laboratory.

Observation

Fritted disc funnels with suction give rapid filtration for pesticide residue analysis of ground wheat, barley and rapeseed but cannot give a filtration of ground oats or rye. Oats, because of a high fiber content, and rye, because of a high gum content, are not readily filterable by any system. This was overcome by covering the fritted disc of the funnel with a layer of 3/8" of ignited Celite 545 and using suction. This gives a fairly rapid filtration and a clear filtrate for oats and rye samples.

Acknowledgment

The authors wish to thank Miss J. W. McAdam for devising the wrench (Fig. 3).

Reference

LEVI, Iser and T. W. NOWICKI. Interfering GLC Peaks from materials and Chemicals in pesticide residue analysis. BULL. ENVIRON. CONTAM. TOXICOL. 7, 193-199. 1972.