

CONSTRUCTION OF A WIDMARK-FLASK SHAKER

by

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ABSTRACT

A Widmark liquid-liquid extraction apparatus consists of two 500-milliliter Erlenmeyer flasks joined near the base by a short length of 2-centimeter glass tubing. This apparatus requires a rocking-chair motion with about six oscillations per minute through an angle of 15 degrees. A shaking device suitable for use with the Widmark apparatus was constructed from scrap materials by use of simple hand tools.

INTRODUCTION

Chemical studies at the Pascagoula Technological Laboratory required the availability of an overnight extraction on a shaker making about six oscillations per minute through an angle of 15 degrees. This type of motion was not obtainable in the equipment listed in scientific catalogs. Several laboratory improvisations failed when attempts were made to utilize electric equipment by means of rheostats. Use of an outdoor barbecue rotisserie motor and gearbox was found to be satisfactory, however, since it described the desired six revolutions per minute.

CONSTRUCTION

A platform, 1 x 8 x 14 inches, was sawed from a pine board to form the base of the shaker. Two 5-inch, 90-degree, metal angle braces were mounted along the edges of the base so that one arm of each formed an upright post 5 inches from one end (fig. 1, A). A flask platform, 1 x 8 x 9 inches, was mounted at its center, so as to pivot on the screws at the top of the upright posts (fig. 1, B). An eccentric cam was constructed, using a 1/4-by 1-inch carriage bolt driven one-half inch off center through three 3-inch diameter, can lids placed side by side and secured by a locknut. The cam was mounted in the hollow shaft protruding from the rotisserie gear box (fig. 1, C). The rotisserie was mounted on the end of the base in such a manner that the can lids fitted under the end of the flask platform (fig. 1, D). A spring was attached

to the end of the platform so as to hold the platform against the eccentric cam (fig. 1, E). Long screws were inserted into the platform to prevent the flasks from sliding (fig. 1, F). A small groove (fig. 1, G) was cut in the base to allow the eccentric cam (can lids) to make a complete revolution. Lubricant was added to the point of friction between the platform and the lids.

MATERIALS

The shaker, which consists of six major parts--base, motor, cam, angle uprights, flask platform, and spring--was constructed from the materials listed in table 1.

Table 1.--Materials and costs

Material	Cost
	<i>Dollars</i>
Base (pine, 1 x 8 x 14 inches).....	\$0.12
Barbecue motor.....	9.00
Cam (carriage bolt, nut, and three can lids).....	0.26
Angle uprights (shelf braces).....	0.20
Flask Platform (pine, 1 x 8 x 9 inches).....	0.07
Spring and two eye hooks.....	0.20
Various screws (10).....	0.15
Total.....	\$10.00

SUMMARY

A shaking apparatus was improvised from an outdoor barbecue rotisserie motor and pieces of scrap materials. This shaker is suitable for use with Widmark liquid-liquid extraction apparatus.

Note.--Physical Science Aide, Chemical, Pascagoula Technological Laboratory, Bureau of Commercial Fisheries.

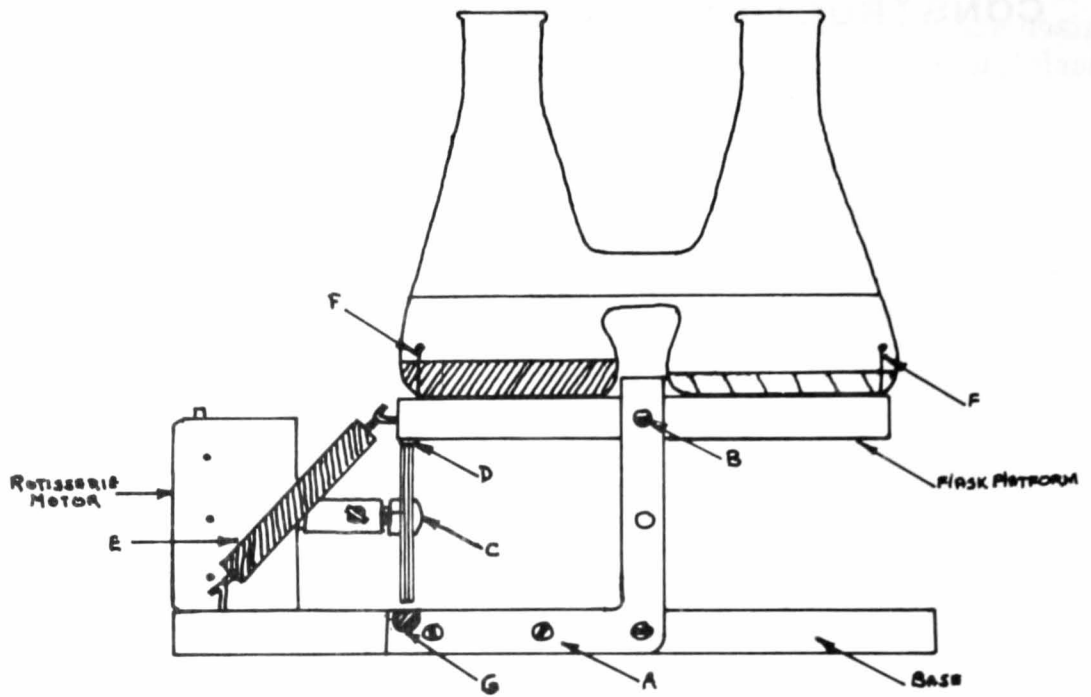


Figure 1.--Side view of shaker with flasks in position.

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