

INVESTIGATION OF THE MICROCOMB CAPACITOR

by 1264

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**THIS BOOK  
CONTAINS  
NUMEROUS PAGES  
WITH DIAGRAMS  
THAT ARE CROOKED  
COMPARED TO THE  
REST OF THE  
INFORMATION ON  
THE PAGE.**

**THIS IS AS  
RECEIVED FROM  
CUSTOMER.**

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## CHAPTER I

### INTRODUCTION

The microcomb capacitor is a recently developed solid state thin film device. The capacitor consists of two coplanar interdigitated microcomb plates located above or within a dielectric. The dielectric material of the capacitor is prepared by a variety of methods such as vacuum deposition, anodic oxidation or ion implantation by the use of an accelerator. A diagram of a typical microcomb capacitor is shown in Figure 1.

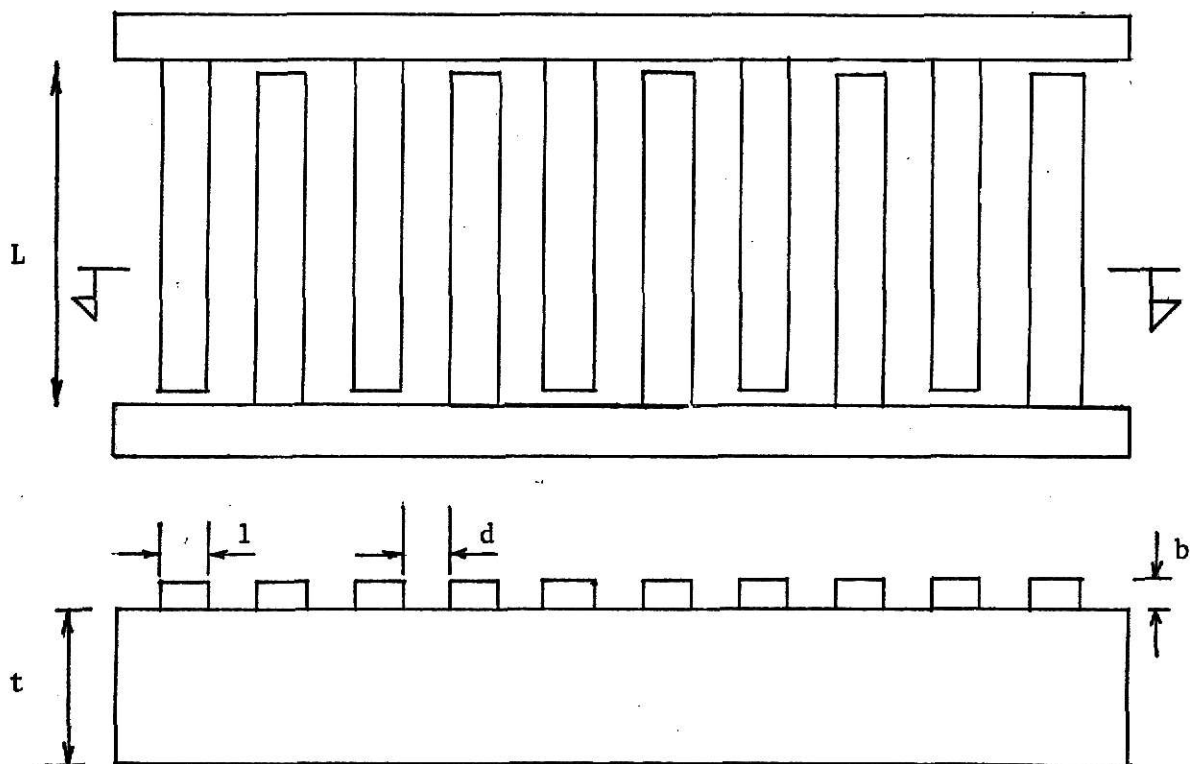


Figure 1. A microcomb capacitor.

The above diagram and the subject matter presented here are taken from a British patent application by Lucas (2). It is maintained in the patent application that the potential advantage of the microcomb capacitor is its

high degree of flexibility to adjust its characteristics to any particular application. It also appears that it is possible to obtain a low dielectric loss and a negative temperature coefficient of resistance for the capacitor, which are desirable, by the use of implantation techniques. Furthermore it is possible to trim the capacitor so as to obtain an accurate value of capacitance. The inherent advantage of a microcomb capacitor is its ease of fabrication. By use of special configuration the capacitor can be used in the GHz range (2).

Cohen et al. have investigated the properties of the microcomb capacitor where a laser beam is used to cut the gap of the capacitor. Apart from this investigation little experimental work has been done. The aim of the present investigation is to examine the theory of the microcomb capacitor and to show how it can be fabricated by the use of the photolithographic process. Since this experiment has not been performed before, the agreement between the theory and the experiment needs to be pointed out. Theoretical justification is presented for the experimental results obtained, and possible improvements in experimental methods are also indicated.