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# United States Patent [19]

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**Aguilera, Jr. et al.**

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- [54] **MULTI-SPECTRAL FILTER**
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- [73] Assignee: **Deposition Sciences, Inc., Santa**  
**Rosa, Calif.**
- [21] Appl. No.: **728,724**
- [22] Filed: **Jul. 11, 1991**

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*Primary Examiner*—Martin Lerner  
*Attorney, Agent, or Firm*—Malcolm B. Wittenberg

### Related U.S. Application Data

- [62] Division of Ser. No. 490,043, Mar. 7, 1990, Pat. No. 5,072,109.
- [51] Int. Cl.<sup>5</sup> ..... **G02B 5/28**
- [52] U.S. Cl. .... **359/587; 250/226;**  
**359/589; 359/590**
- [58] Field of Search ..... 359/587, 589, 590, 568,  
**359/576; 250/226**

### [57] ABSTRACT

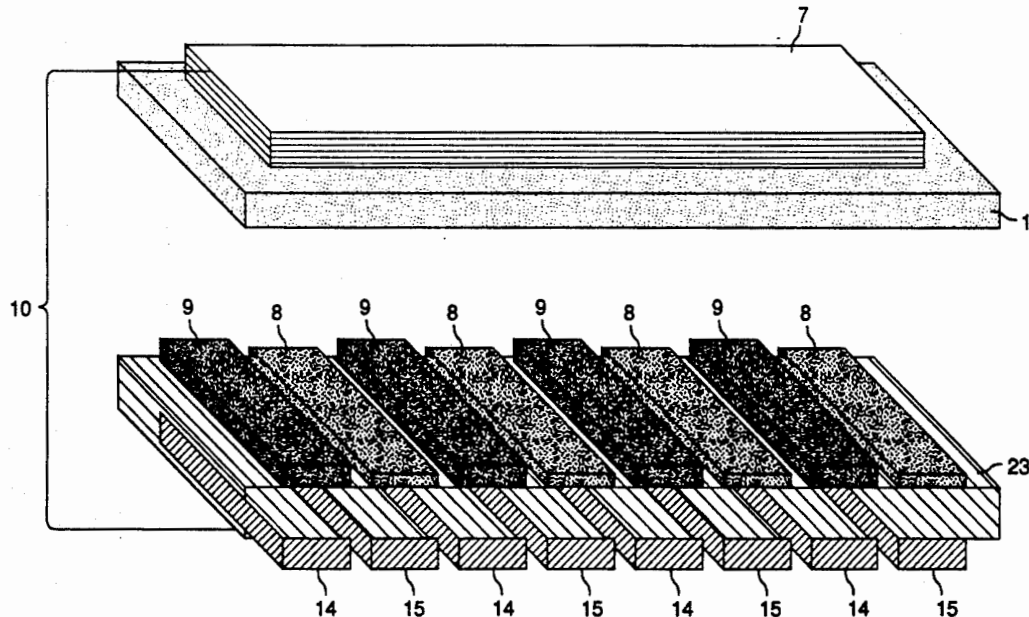
An optical thin film filter for the spatial and spectral separation of two or more transmitting bands of radiant energy. For a two band filter the filter has a substrate substantially transparent to radiant energy in the transmitted bands. On one surface of said substrate is a multi-layer interference coating that transmits both wavelength bands of interest. On the other surface of said substrate (or on the same surface) are two sets of non-overlapping butted, parallel stripes with one set being alternately interspersed with the other. The widths of said stripes are varied to provide for precisely defined regions of spatial and spectral delineation. One set of stripes is capable of transmitting one of the bands of interest and reflecting all others, while the second set of stripes is capable of transmitting at least one band different from the one band transmitted by said first set of stripes and reflecting all others. Each of the stripes in itself is a multilayer interference coating formed of a plurality of high and low index of refraction materials.

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**31 Claims, 11 Drawing Sheets**



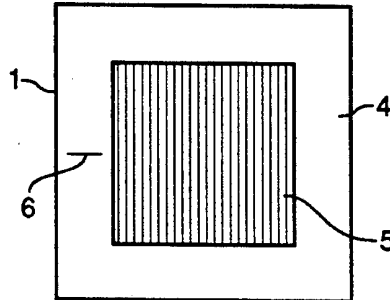


FIG. 1

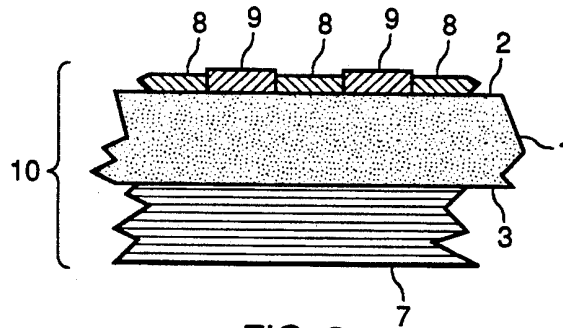


FIG. 2

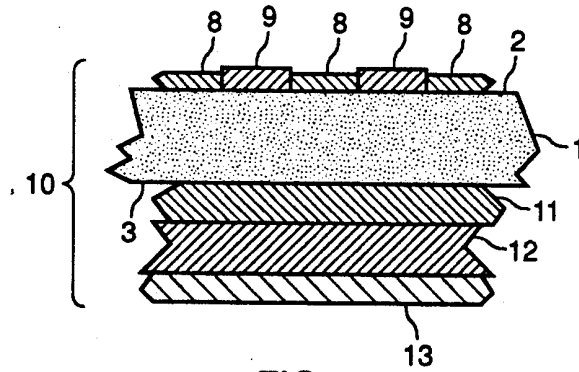


FIG. 3

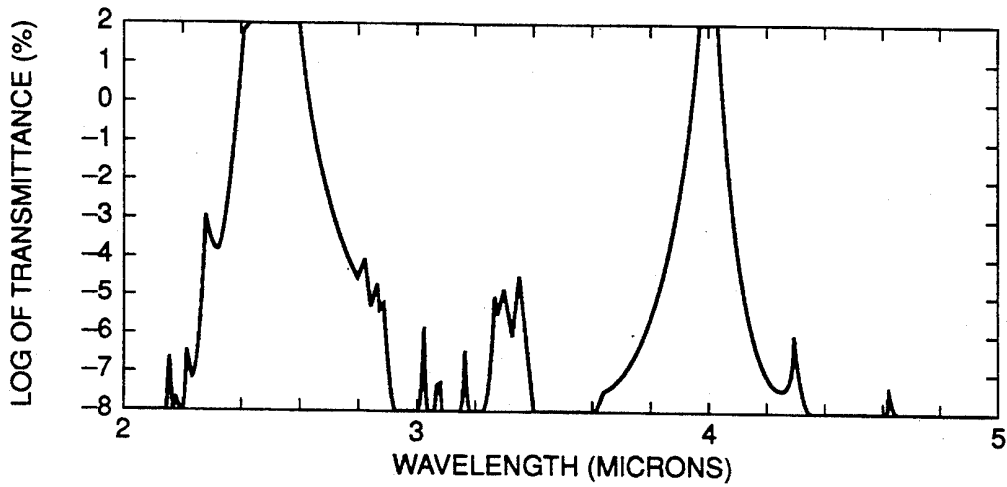


FIG. 4

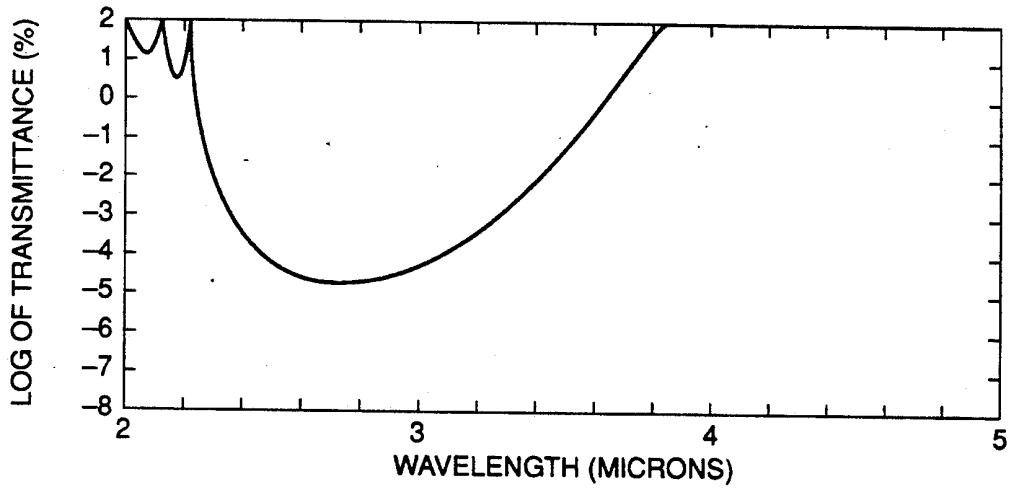


FIG. 5

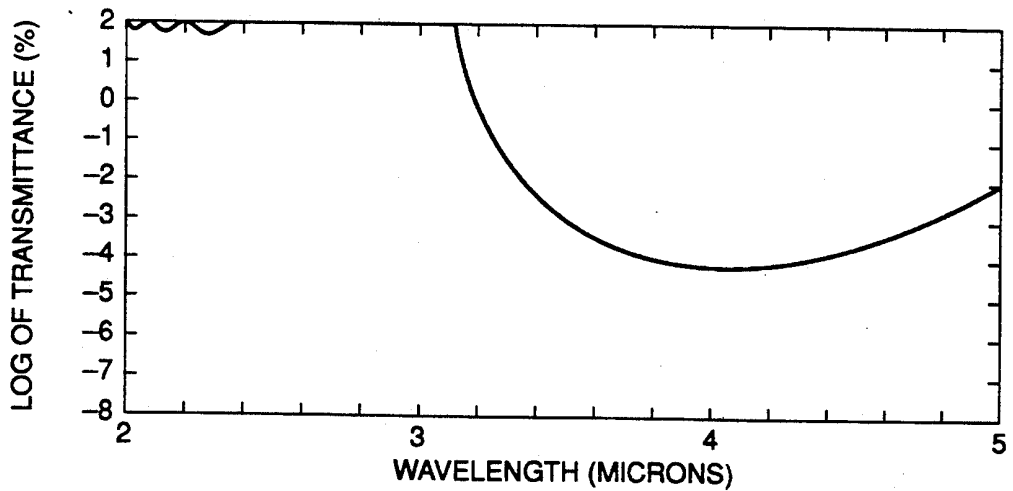


FIG. 6

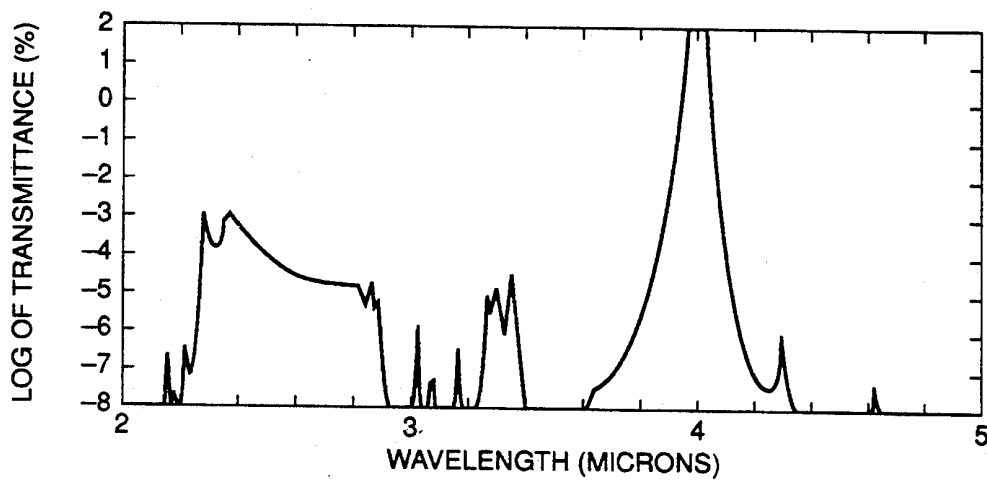


FIG. 7

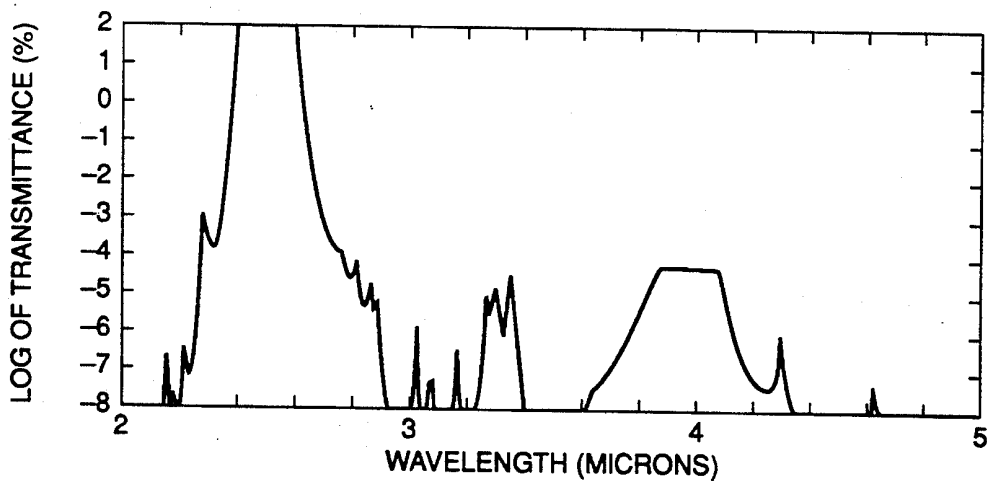


FIG. 8

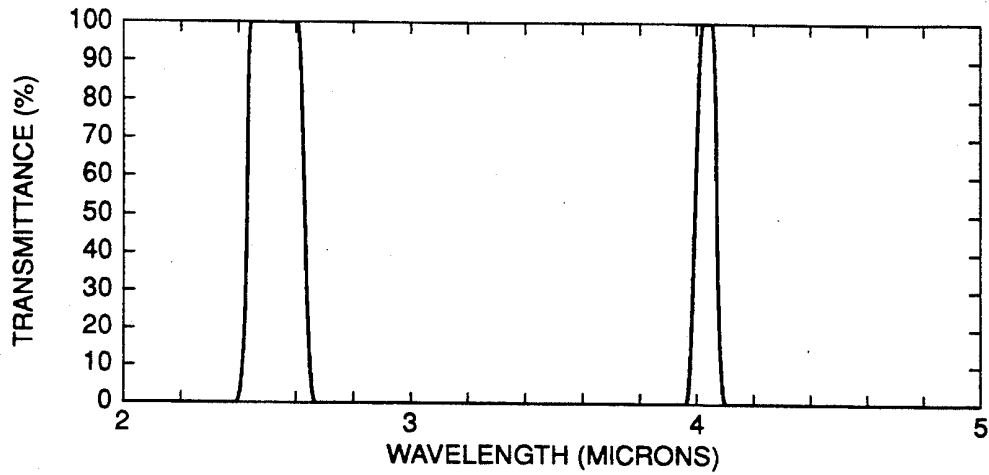


FIG. 9

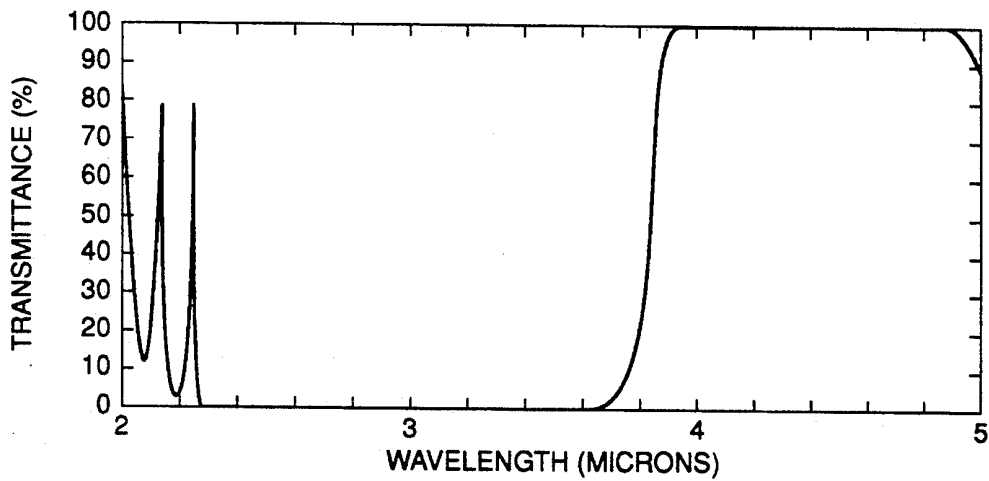


FIG. 10

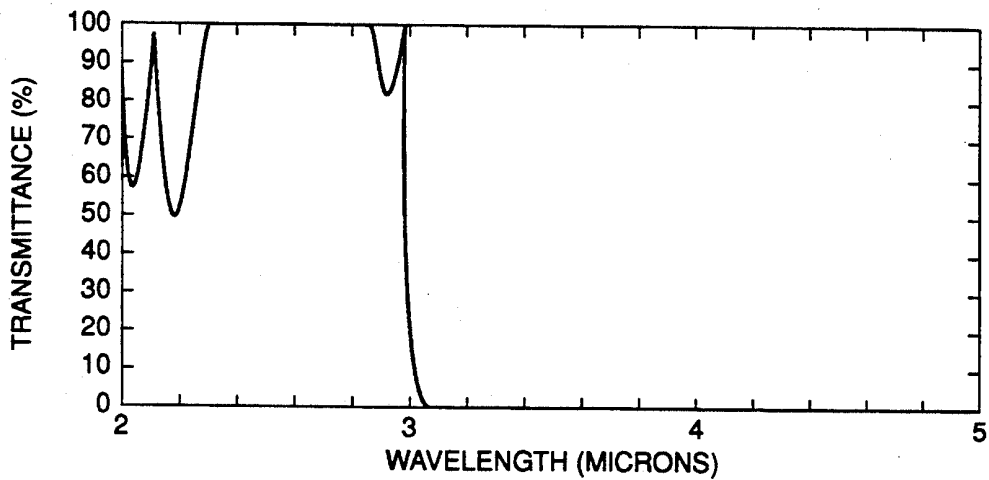


FIG. 11

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