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(54) **SHEET-TYPE VIBRATOR AND ACOUSTIC APPARATUS**

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(58) **Field of Classification Search** ..... 310/328,  
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See application file for complete search history.

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**ABSTRACT**

In a sheet-type piezoelectric vibrator provided with a piezoelectric sheet made from a transparent organic polymer and electrodes formed on respective main surfaces that are opposite to each other of the piezoelectric sheet, an electrode material that is effectively used for making the vibrator colorless is provided. The first electrodes formed on one of the main surfaces of piezoelectric sheets are made of zinc oxide electrode layers, each mainly containing zinc oxide, and second electrodes formed on the other main surface of the piezoelectric sheets include polythiophene electrode layers made from a conductive polymer containing thiophene in a molecule structure thereof. Although the zinc oxide electrode layer is transparent, it is slightly yellowish, while, on the other hand, although the polythiophene electrode layer is also transparent, it is slightly bluish. Since the spectral characteristic of light transmitted through these two electrode layers is made substantially flat in the visible region, the coloring of the transmitted light is suppressed so that the layers appear colorless and transparent.

**19 Claims, 6 Drawing Sheets**

