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[54] **ETHANOL PRODUCTION BY *ESCHERICHIA COLI* STRAINS CO-EXPRESSING *ZYMOMONAS* PDC AND ADH GENES**

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Related U.S. Application Data

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[58] **Field of Search** 435/161, 170, 172.3, 435/320, 253, 252.33, 252.3; 536/27; 935/27, 19, 40, 60, 41, 29, 73

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[57] **ABSTRACT**

A novel operon and plasmids comprising genes which code for the alcohol dehydrogenase and pyruvate decarboxylase activities of *Zymomonas mobilis* are described. Also disclosed are methods for increasing the growth of microorganisms or eukaryotic cells and methods for reducing the accumulation of undesirable metabolic products in the growth medium of microorganisms or cells.

7 Claims, 4 Drawing Sheets