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Freeman et al.

[11] **Patent Number:** **5,965,717**[45] **Date of Patent:** **Oct. 12, 1999**[54] **ORGANIC PIGMENTS FROM TWISTED BENZIDINES**[75] Inventors: **Harold S. Freeman**, Raleigh, N.C.;
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Raleigh, N.C.[21] Appl. No.: **08/963,963**[22] Filed: **Nov. 4, 1997**[51] **Int. Cl.**⁶ **C07C 245/08**; C07C 255/17;
C07D 403/12; C07D 235/26[52] **U.S. Cl.** **534/823**; 534/825; 855/296;
548/365; 548/305.4; 558/394[58] **Field of Search** 534/823, 825;
544/296; 548/365, 305.4; 558/394[56] **References Cited****U.S. PATENT DOCUMENTS**

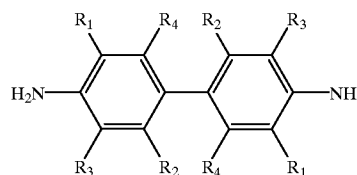
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Assistant Examiner—Dominic Keating
Attorney, Agent, or Firm—Jenkins & Wilson, P.A.[57] **ABSTRACT**

Nonmutagenic, highly twisted derivatives of benzidine of the following formula



useful as intermediates for the preparation of various organic pigments were obtained. The benzidine derivatives are significantly rotated about the biphenyl linkage due to bulky substituents at the R_2 and/or R_4 positions. Bisazomethine, disazoacetanilide, disazopyrazolone, disazobenzimidazolone and disazonaphthol pigments prepared from these highly twisted benzidines exhibit hypsochromic spectral shifts relative to pigments prepared from other benzidine compounds with less twist about the biphenyl linkage, for instance, other benzidine compounds in which all four R_2 and R_4 represent H. Greenish-yellow, yellow, orange, red and brown pigments obtained from the twisted benzidines are nonmutagenic in the standard Ames test and Prival modification.

16 Claims, No Drawings