

[54] **DEVICE FOR OPTICALLY READING MARKED BALLOTS USING INFRARED AND RED EMITTERS**

[75] Inventor: **James D. Stewart, San Pablo, Calif.**

[73] Assignee: **Business Records Corporation, Dallas, Tex.**

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[52] U.S. Cl. **235/468; 235/454; 235/386; 235/475**

[58] Field of Search **235/454, 468, 456, 475, 235/440; 283/5**

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Primary Examiner—John Shepperd

Assistant Examiner—Esther Chin

Attorney, Agent, or Firm—Hubbard, Thurman, Tucker & Harris

[57] **ABSTRACT**

A read head for optically scanning a ballot on which votes are cast by marking the ballot with a writing instrument within a voting area defined between a pair of spaced-apart timing marks includes infrared emitters illuminating the timing marks and emitters of visible light illuminating the voting area between the marks. The illuminated portions of the ballot are imaged onto three PIN photodiodes placed in a line. The outer two PIN photodiodes are effectively apertured to resolve the timing marks and the middle PIN photodiode is effectively apertured to resolve a voting mark of a predetermined minimum size. The ballot, the image and the apertures are carefully aligned such that the photodiodes detect changes in light level associated with an image of a mark passing across the apertures.

23 Claims, 4 Drawing Sheets

