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# United States Patent [19]

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Alon et al.

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[54] **METHODS AND APPARATUS FOR SIMULTANEOUSLY READING MULTIPLE TRACKS OF AN OPTICAL STORAGE MEDIUM**

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[\*] Notice: This patent is subject to a terminal disclaimer.

[21] Appl. No.: **09/203,294**

[22] Filed: **Dec. 1, 1998**

### Related U.S. Application Data

[60] Division of application No. 08/804,105, Feb. 20, 1997, Pat. No. 5,907,526, which is a continuation-in-part of application No. 08/559,429, Nov. 15, 1995, Pat. No. 5,627,805.

[51] Int. Cl.<sup>7</sup> ..... **G11B 5/09**; G11B 3/74; G11B 7/00

[52] U.S. Cl. .... **369/49**; 369/95; 369/124

[58] Field of Search ..... 369/32, 33, 47, 369/48, 49, 50, 54, 58, 60, 124, 95

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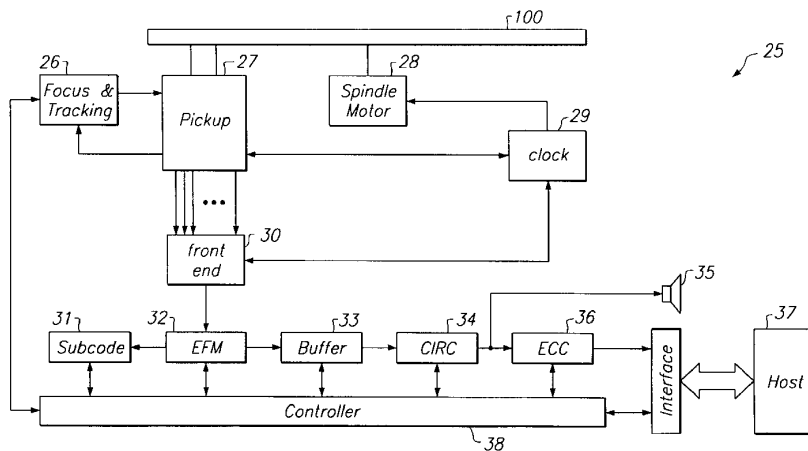
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#### [57] ABSTRACT

Methods and apparatus are provided for synchronously reading data from multiple tracks of an optical disk using multiple illumination beams. Circuitry is provided for use with a photodetector array to read and buffer data in parallel from the multiple adjacent tracks, while asynchronously providing processed data to a host processor. Circuitry is further provided for correcting phase errors resulting from variations in the linear velocity of the tracks being read, depending upon the radial position of the tracks.

**20 Claims, 9 Drawing Sheets**



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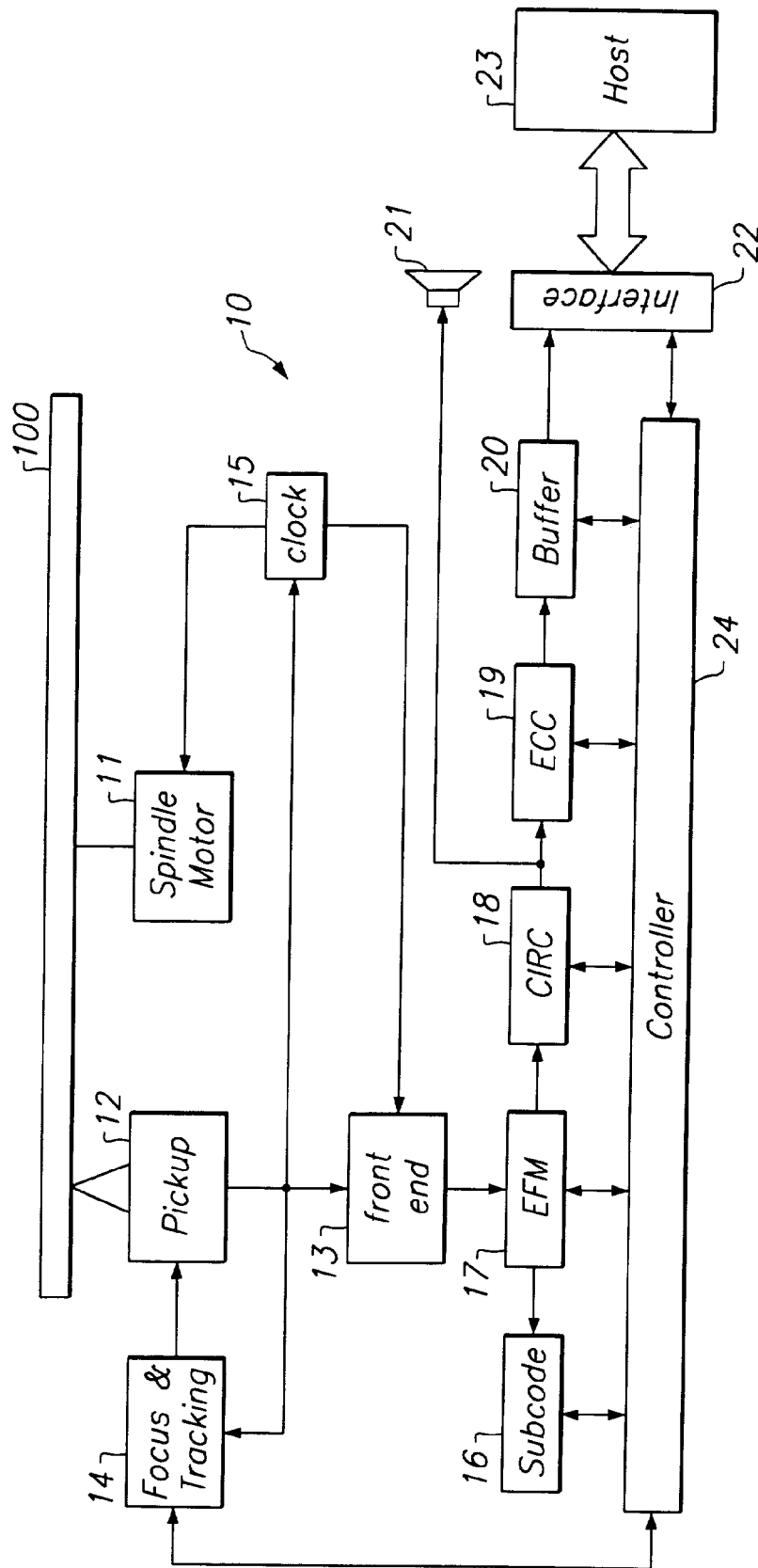


FIG. 1 (Prior Art)

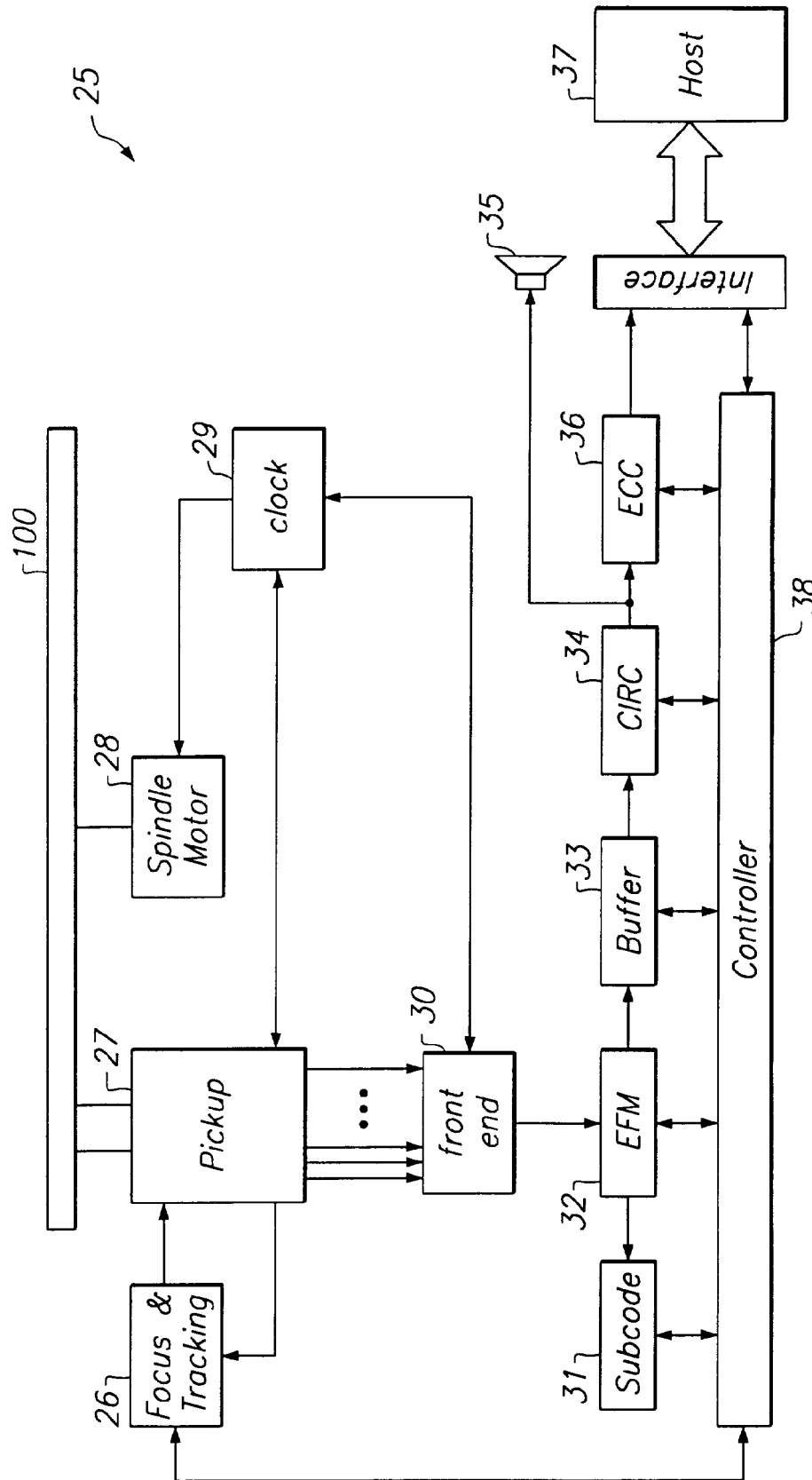


FIG. 2

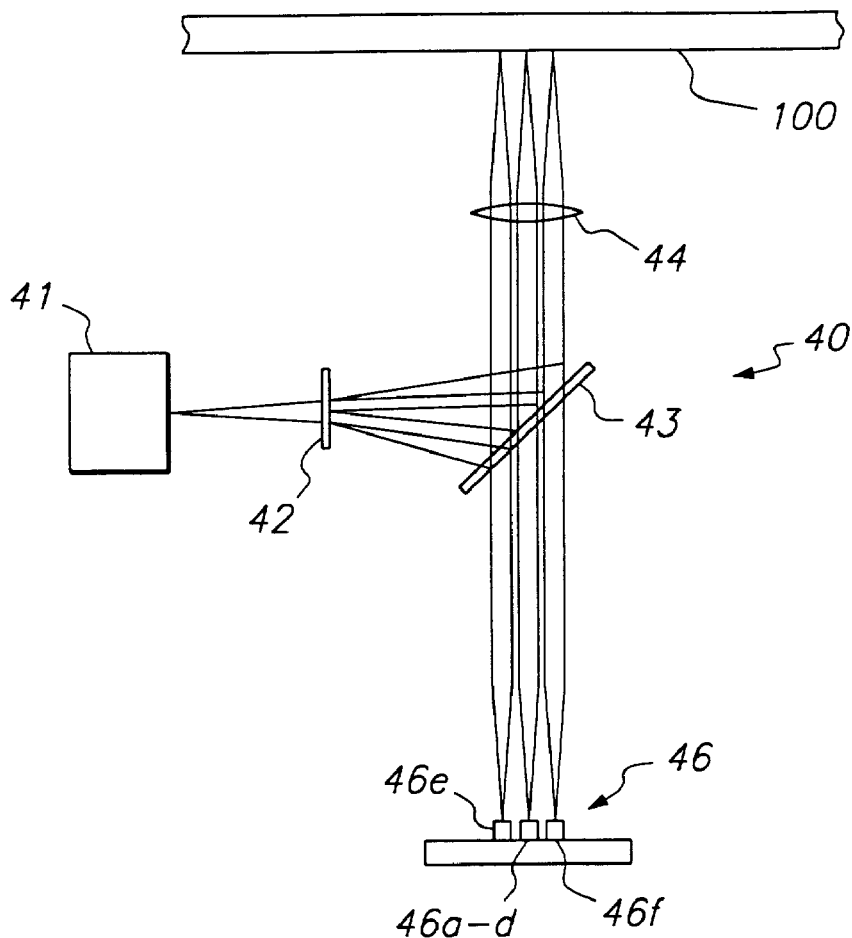


FIG. 3

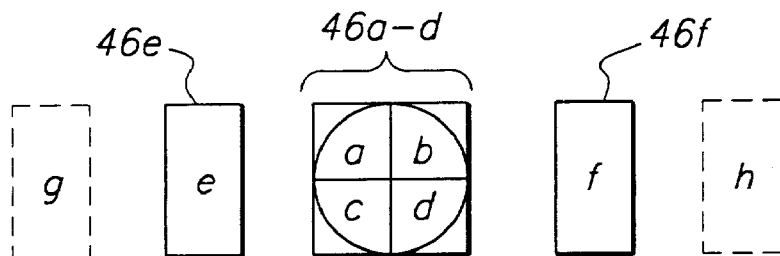


FIG. 4

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