United States Patent [19]

Bilbrey et al.

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[54] **OPTO-MECHANICAL CURSOR POSITIONING DEVICE**

[75] Inventors: **Robert A. Bilbrey**, Orinda; **Bruce R. Koball**, Berkely, both of Calif.

[73] Assignees: **Universal Supply, Inc.; Edward F. Towers**, both of San Francisco, Calif.

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[52] **U.S. Cl.** ..... **340/710**; 340/709; 178/18; 250/231 R

[58] **Field of Search** ..... 340/710, 709, 870.29, 340/708, 707; 178/17 D, 18, 19, 20; 364/190; 382/59, 65, 69; 74/471 XY; 250/231 R, 234, 203 CT, 549

[56] **References Cited**

U.S. PATENT DOCUMENTS

3,541,541	11/1970	Engelbart	340/710
3,805,907	4/1974	Knothe et al.	250/234
3,835,464	9/1974	Rider	340/710
3,892,963	7/1975	Hawley et al.	250/231 R
3,967,135	6/1976	Balban et al.	250/231 R
3,987,685	10/1976	Opocensky	74/471 XY
4,260,979	4/1981	Smith	340/707
4,318,096	3/1982	Thornburg et al.	340/710
4,390,873	6/1983	Kirsch	340/710
4,409,479	10/1983	Sprague et al.	340/710

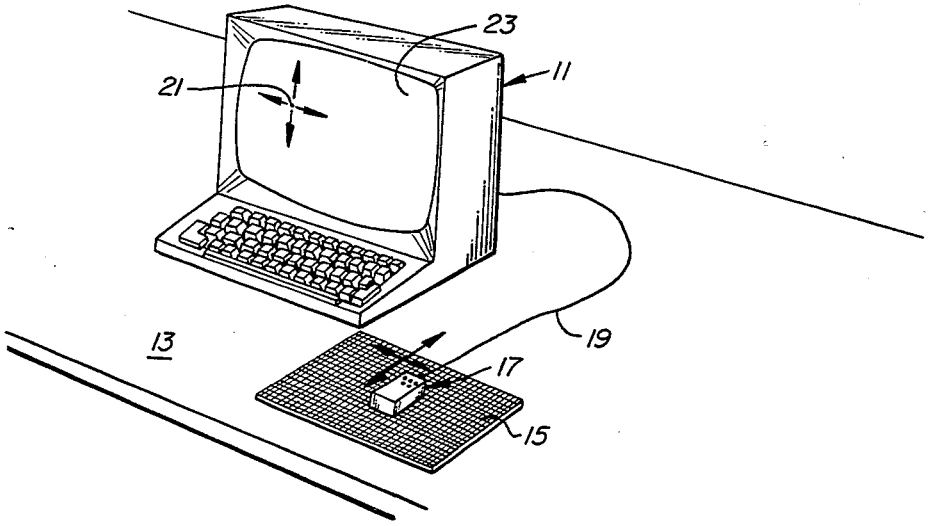
OTHER PUBLICATIONS

VLSI Design, Jan./Feb. 1982, "Designing and Testing the Optical Mouse", Lyon and Haeberli, pp. 20–30.

Primary Examiner—Gerald L. Brigance

Attorney, Agent, or Firm—Majestic, Gallagher, Parsons & Siebert

[57] **ABSTRACT**

A hand-held "Mouse" contains an optical system for detecting the number of patterns crossed by its movement across a periodic optical pattern. The optical system is limited to detecting the distance traveled by the mouse across the pattern, a mechanical displacement device within the mouse being utilized to detect the direction of movement. Signals from the optical distance detector and the mechanical direction detector are combined to drive the cursor in a controlled direction across a cathode ray tube or other display device.

6 Claims, 8 Drawing Figures