

[54] SINGLE-ELECTRODE CAPACITANCE TOUCHPAD SENSOR SYSTEMS

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[52] U.S. Cl. .... 328/5; 307/116; 307/308; 340/562

[58] Field of Search ..... 328/5; 307/308, 116; 331/65; 340/552, 365 C; 202/DIG. 1

[56] References Cited

U.S. PATENT DOCUMENTS

3,846,780	11/1974	Gilcher .....	340/562
3,846,791	11/1974	Foster .....	307/308
3,893,035	7/1975	Higgins .....	307/307
4,016,490	4/1977	Weckenmann et al. ....	200/DIG. 1
4,107,555	8/1978	Haas et al. ....	328/5
4,136,291	1/1979	Waldron .....	307/308

OTHER PUBLICATIONS

IBM Tech. Disclre. Blttn., Touch-Sensing Circuit, J. A. Williams vol. 17, No. 1, 6/74 pp. 166 & 167.

Primary Examiner—Stanley D. Miller, Jr.

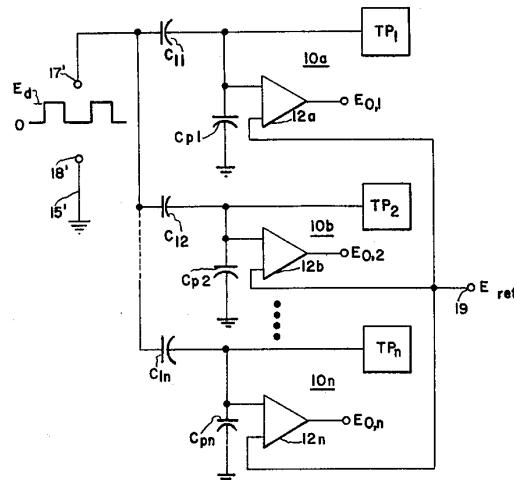
Assistant Examiner—B. P. Davis

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[57] ABSTRACT

Each of an array of capacitive touchpad sensors has a single touchpad electrode fabricated upon a substrate and accessible to user personnel, with series coupling and shunt capacitance being provided respectively between a driving generator and the touchpad electrode, and the touchpad electrode and an array ground. Each capacitive touchpad sensor operates with a sense amplifier to provide a high density sensor array requiring relatively low driving voltage amplitudes and may be utilized with driven shields and a normalization network to provide reliable capacitance sensing with reduced sensitivity to contamination of the surface of the sensor array.

20 Claims, 8 Drawing Figures



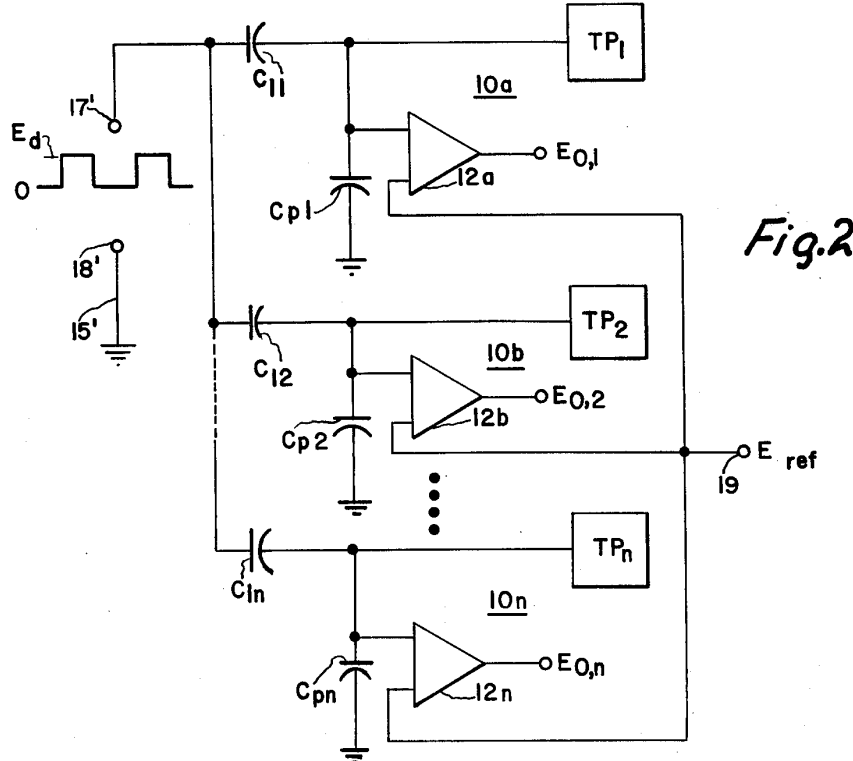
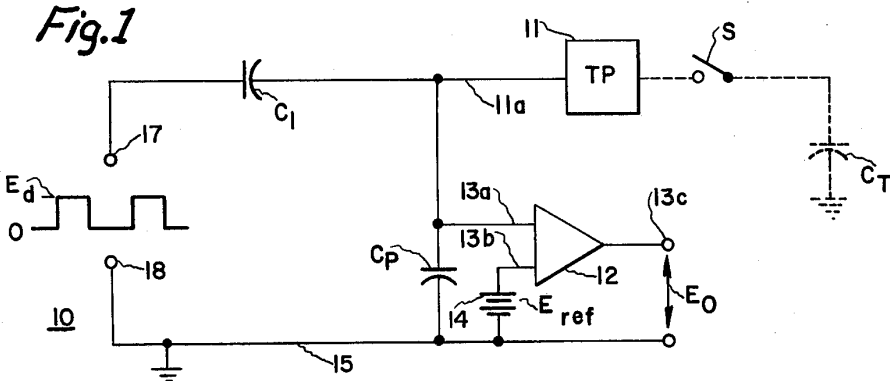


Fig. 3

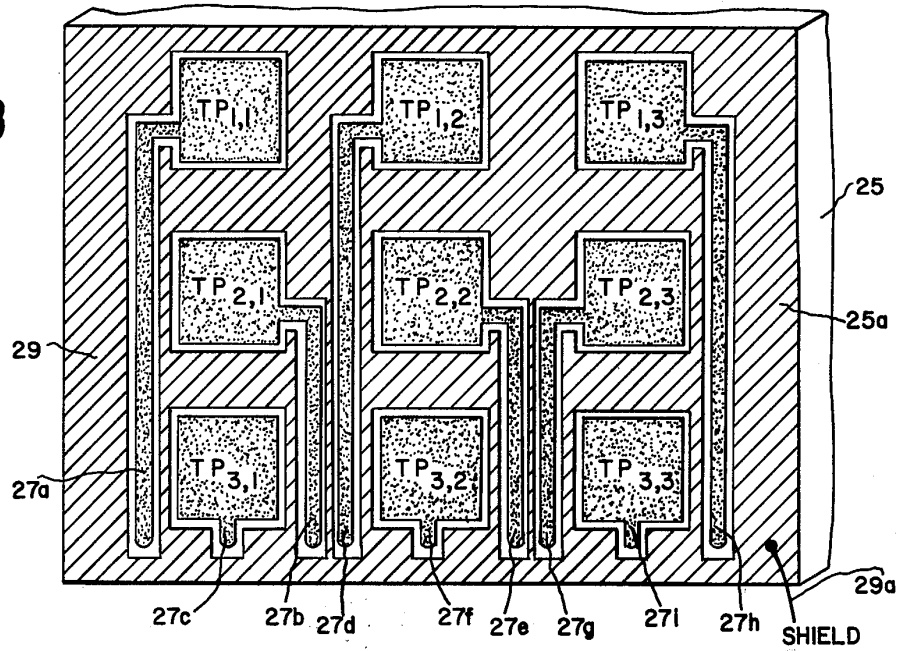


Fig. 4

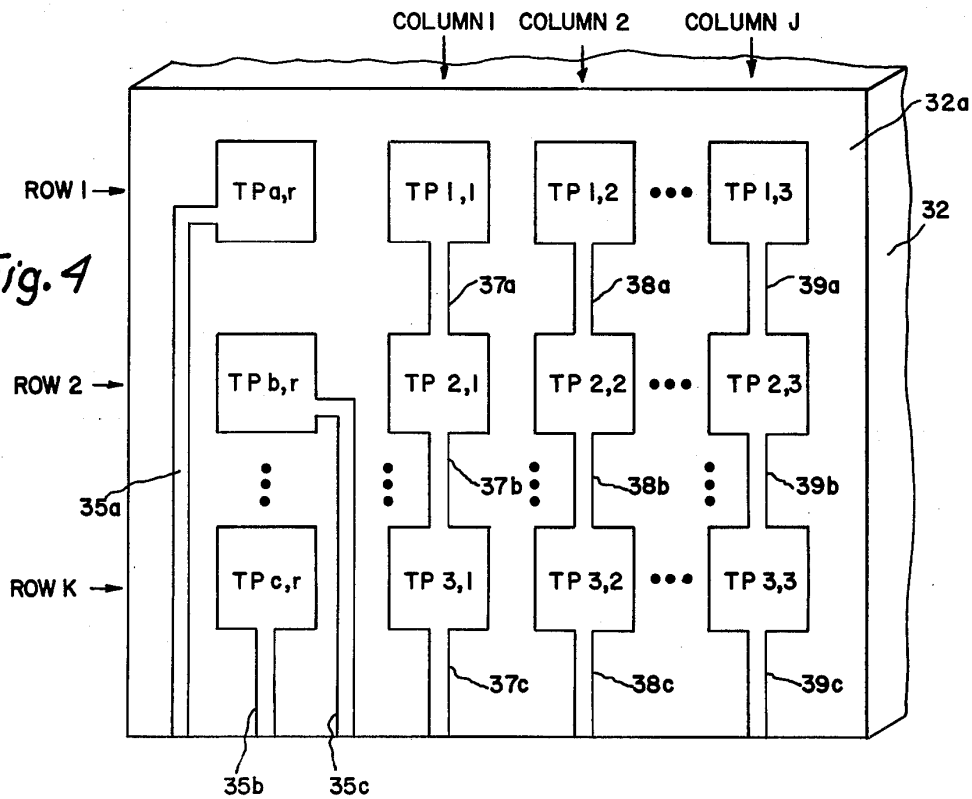
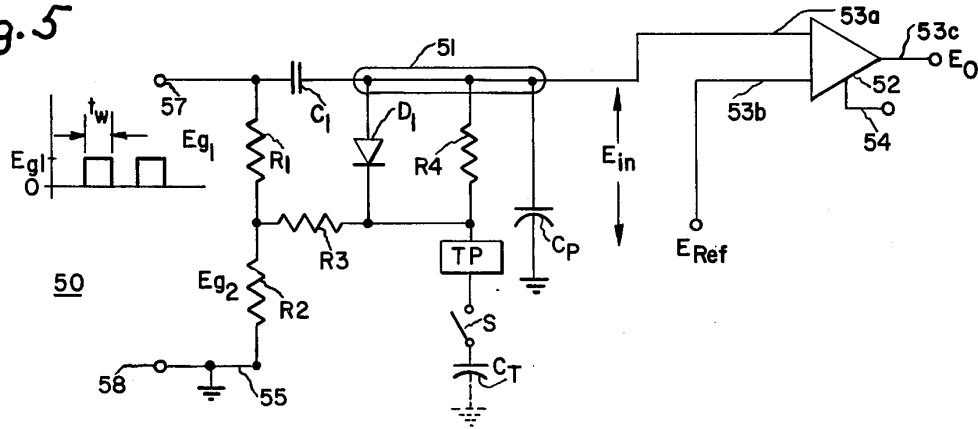
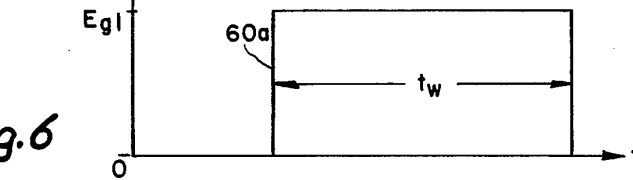


Fig. 5



WAVEFORM A

Fig. 6



WAVEFORM B

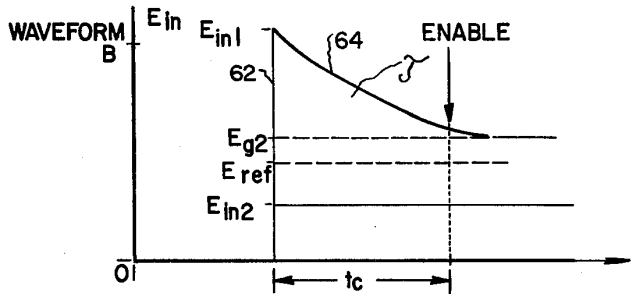


Fig. 7

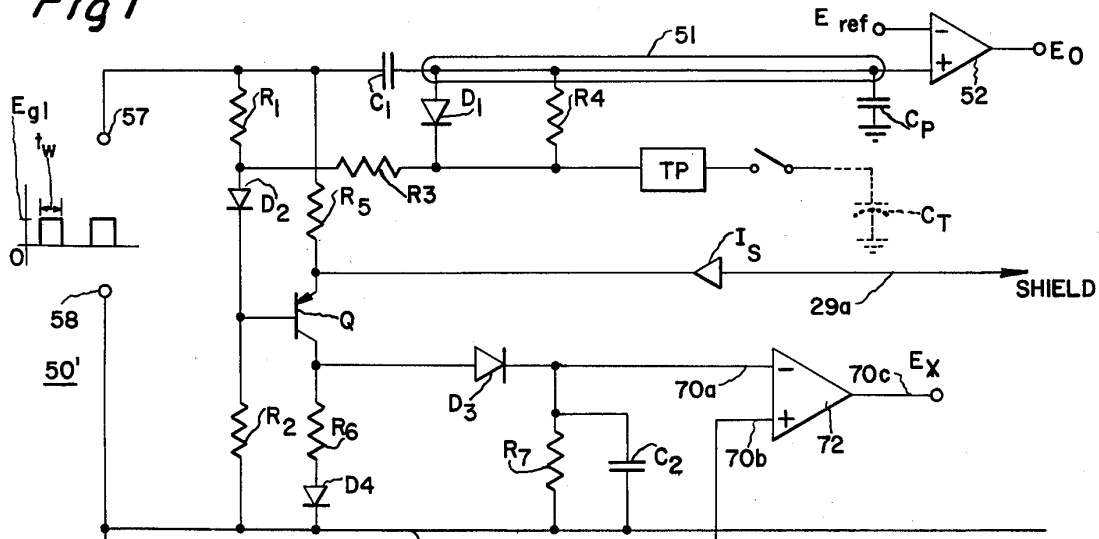
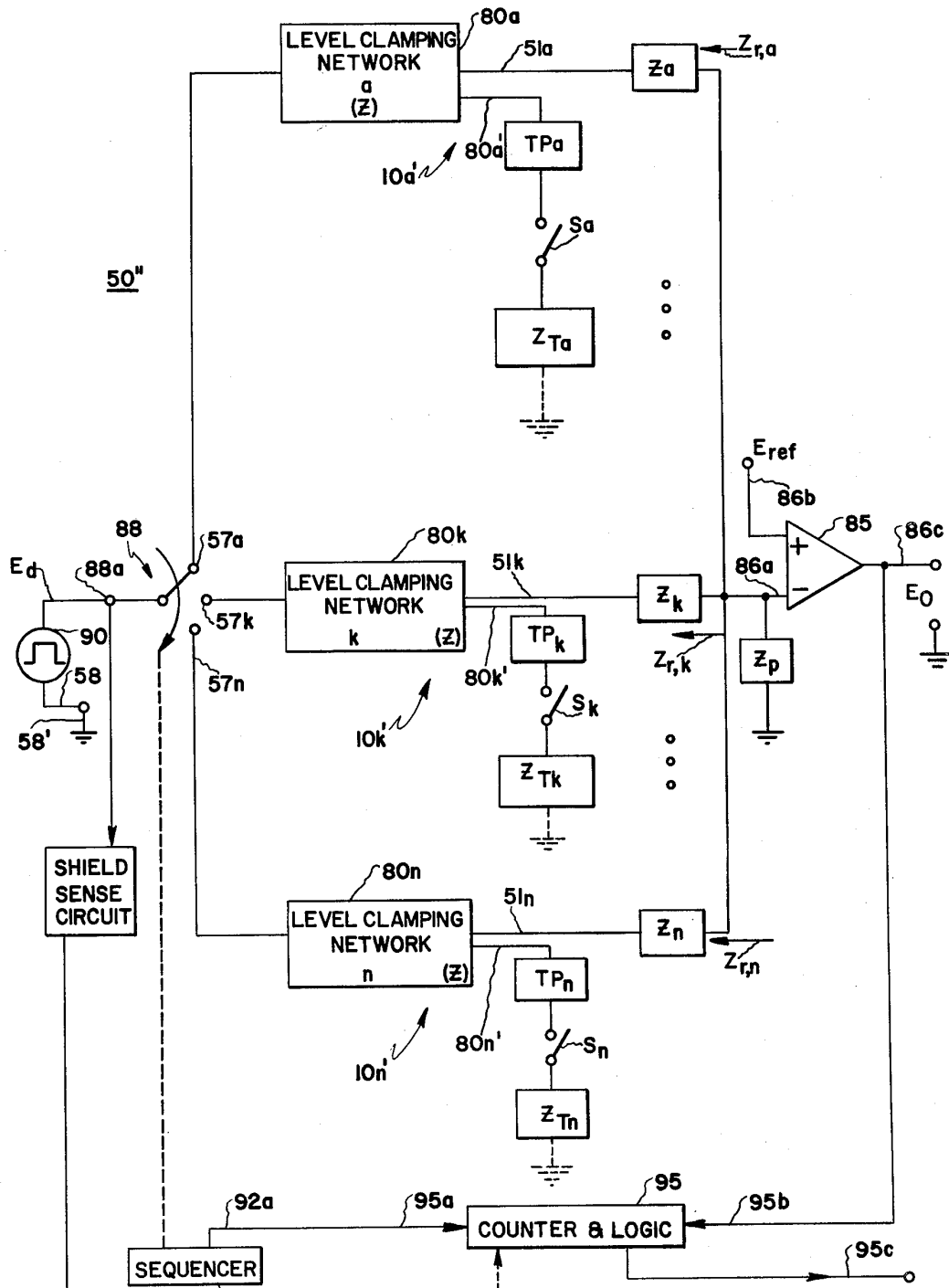


Fig. 8



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