

[54] CAPACITIVE TOUCH SWITCH ARRANGEMENT

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[73] Assignee: General Electric Company, Louisville, Ky.

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[52] U.S. Cl. 340/365 C; 200/5 A; 200/DIG. 1; 340/365 R

[58] Field of Search 340/365 C, 365 E, 365 R, 340/365 S, 365 A; 400/479.1; 200/DIG. 1, 5 A; 179/90 K; 219/10.77

4,237,421 12/1980 Waldron 340/365 C

4,288,786 9/1981 Ledniczki 340/365 C

4,290,061 9/1981 Serrano 340/712

4,394,643 7/1983 Williams 340/365 C

4,398,181 8/1983 Yamamoto 340/365 C

4,413,252 11/1983 Tyler 340/365 C

4,415,781 11/1983 Frame 340/365 C

4,441,097 4/1984 Anderson 340/365 A

4,446,350 5/1984 Mizukawa 340/365 E

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 Attorney, Agent, or Firm—H. Neil Houser; Radford M. Reams

[56] References Cited
 U.S. PATENT DOCUMENTS

3,482,241	12/1969	Johnson	.....	340/365 C
3,653,038	3/1972	Webb	.....	340/365 C
3,668,417	6/1972	Sessler	.....	340/365 C
3,691,555	9/1972	Looschen	.....	340/365
3,750,149	7/1973	Sessler	.....	340/365 C
3,786,495	1/1974	Spence	.....	340/365 C
3,846,791	11/1974	Foster	.....	340/365 C
3,971,013	7/1976	Challoner et al.	.....	340/337
4,027,306	5/1977	Hackmeister	.....	340/365 C
4,053,789	10/1977	Schultz	.....	307/116
4,125,783	11/1978	Sefton	.....	307/116
4,136,291	1/1979	Waldron	.....	307/308
4,145,748	3/1979	Eichelberger et al.	.....	364/862
4,157,539	6/1979	Hunts et al.	.....	340/365 C
4,221,975	9/1980	Ledniczki	.....	340/365 C
4,233,522	11/1980	Grummer et al.	.....	307/116

[57] ABSTRACT

A capacitive attenuator type touch switch cell arrangement employs a touch responsive pad or electrode and a receiver electrode of comparable surface area on opposing surfaces of a dielectric substrate for capacitive coupling therebetween, which capacitive coupling is alterable by the human touching of or proximate to the touch pad. A scan signal is coupled from signal generating circuitry to the touch responsive pad by a separate transmitting capacitor. Signal detection circuitry senses the signal coupled to the receiver electrode to detect attenuation of the coupled signal signifying the touching of the touch pad. The use of a separate capacitor to provide the transmitting capacitance reduces the touch pad area requirement, thereby permitting closer spacing of touch switch cells for greater switch density on a control panel.

10 Claims, 15 Drawing Figures

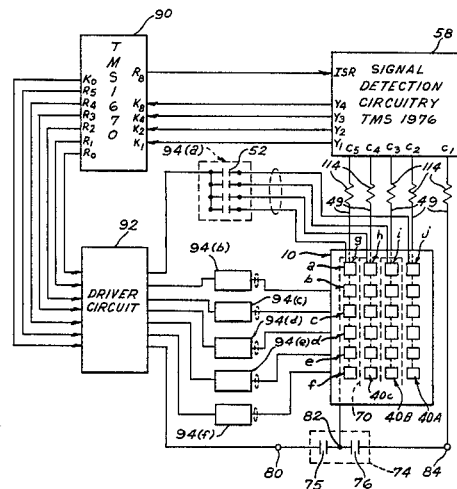


FIG. 1

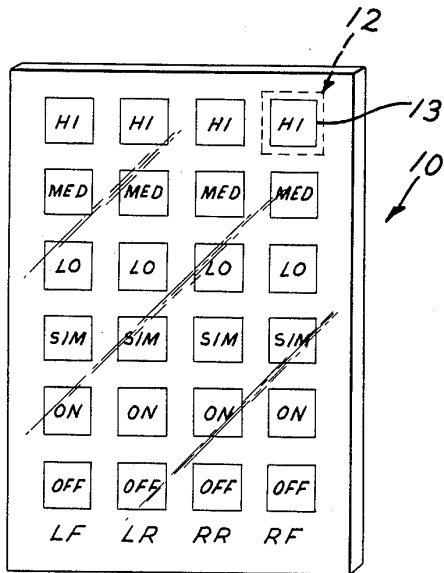


FIG. 9

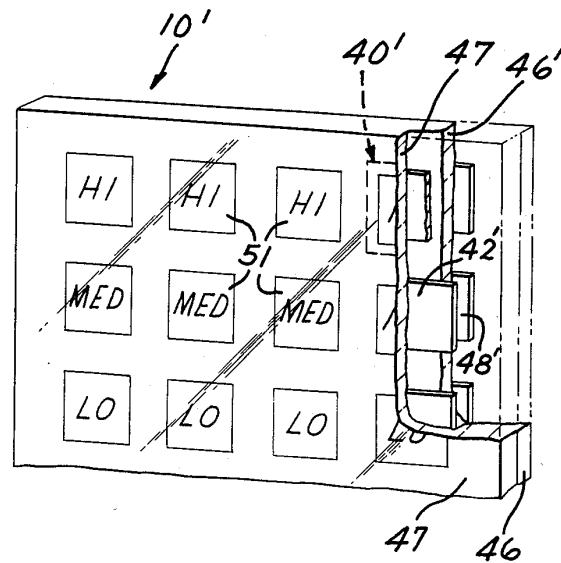
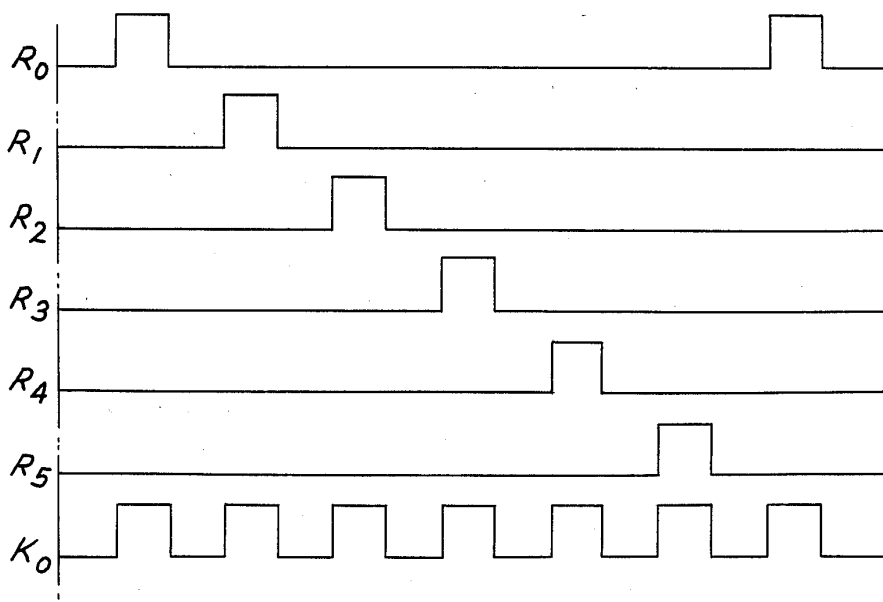
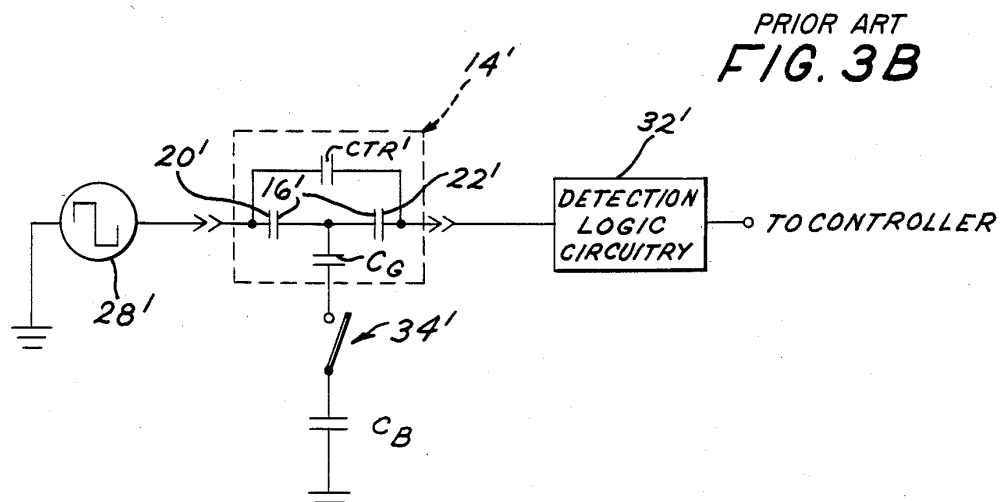
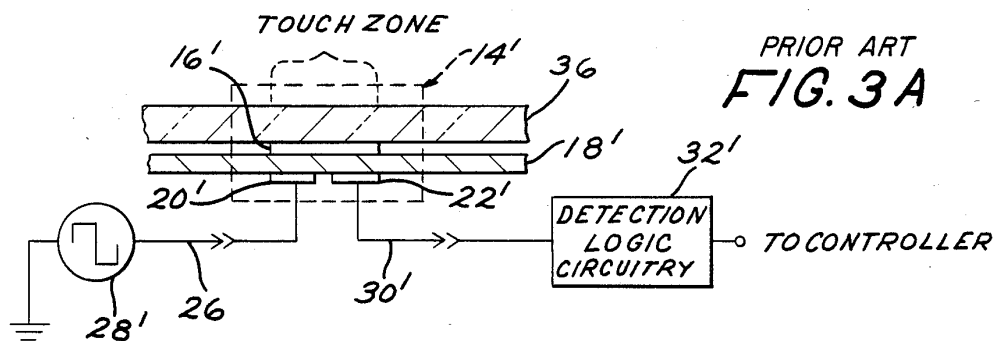
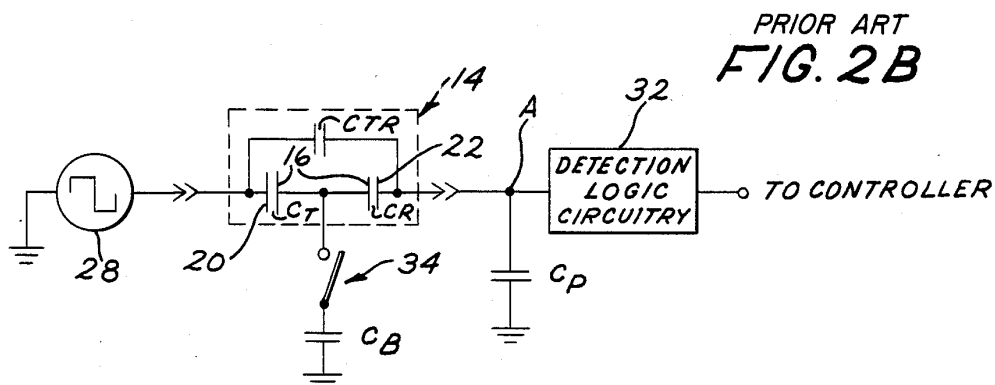
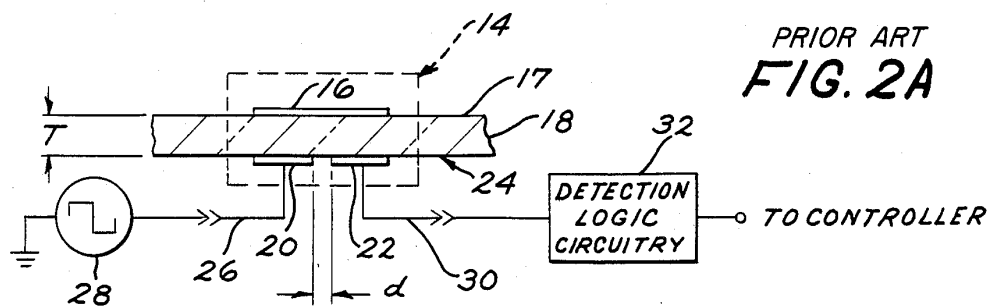


FIG. 7





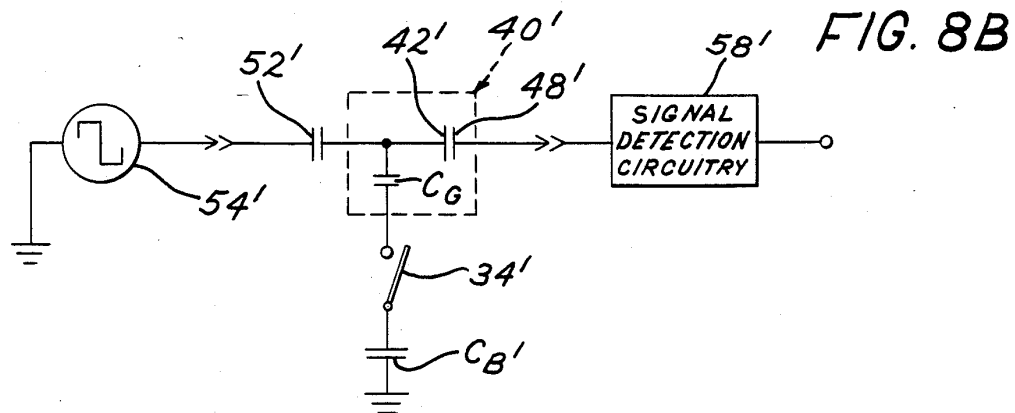
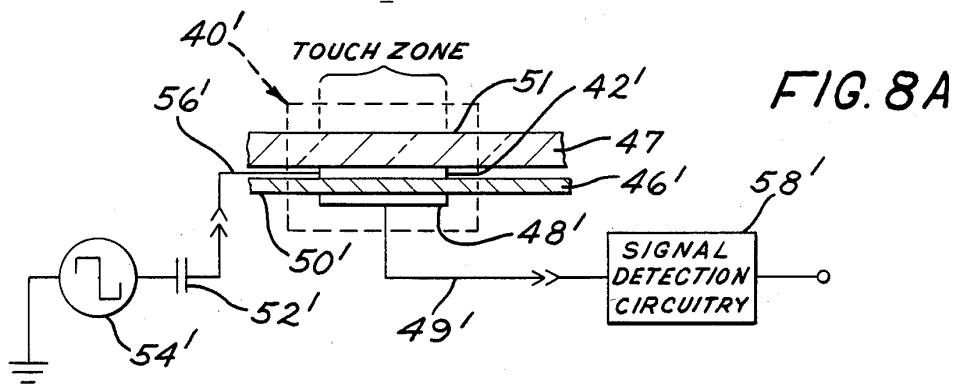
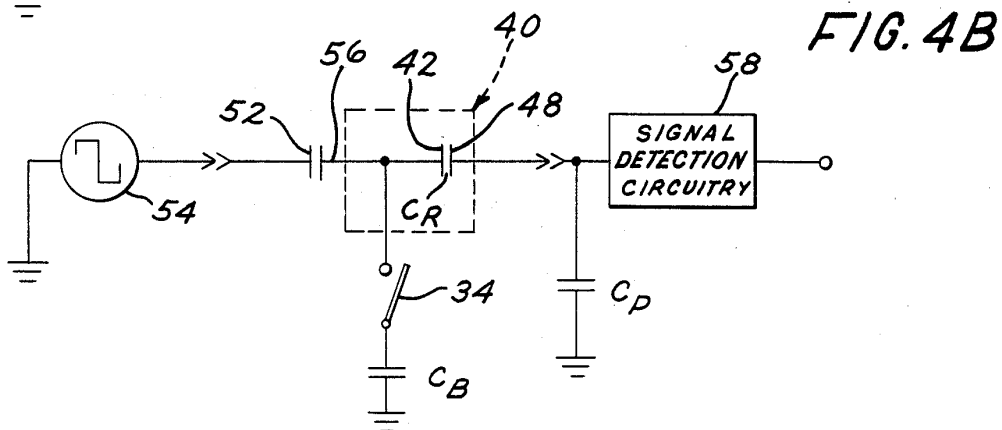
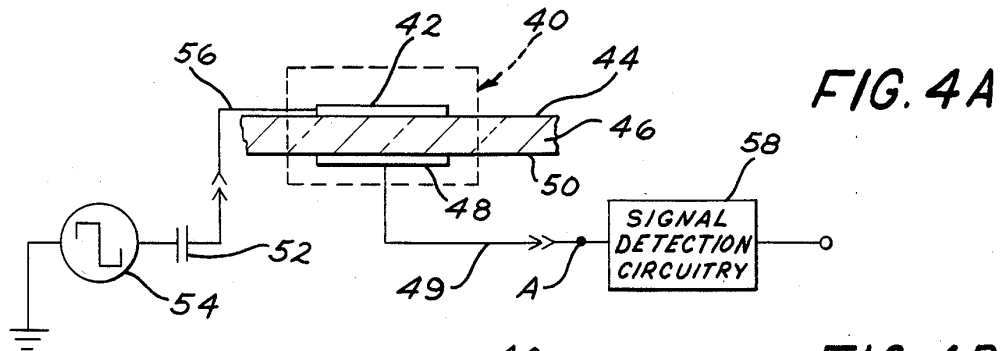


FIG. 5A

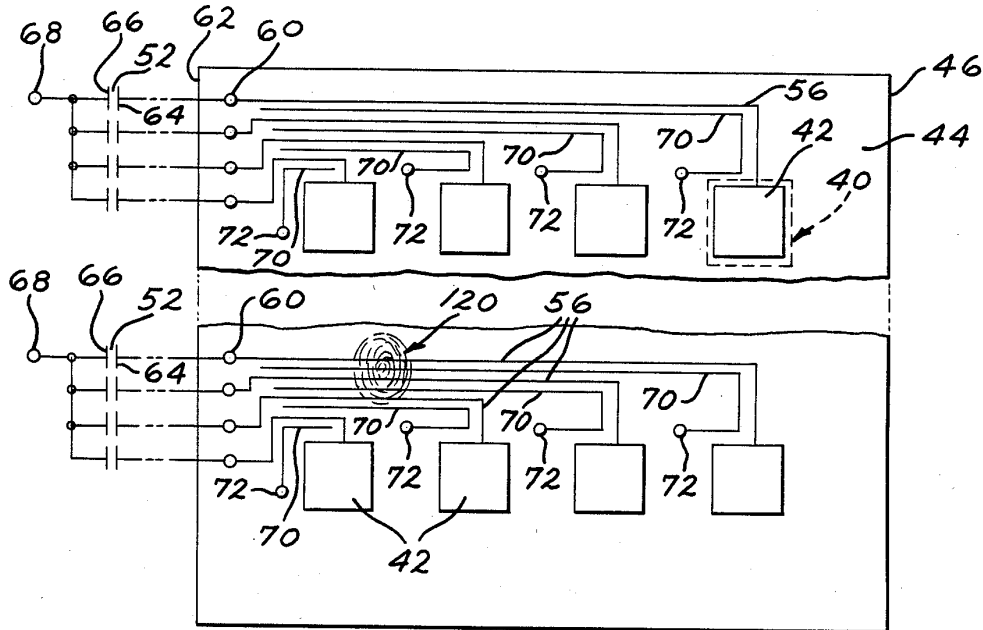
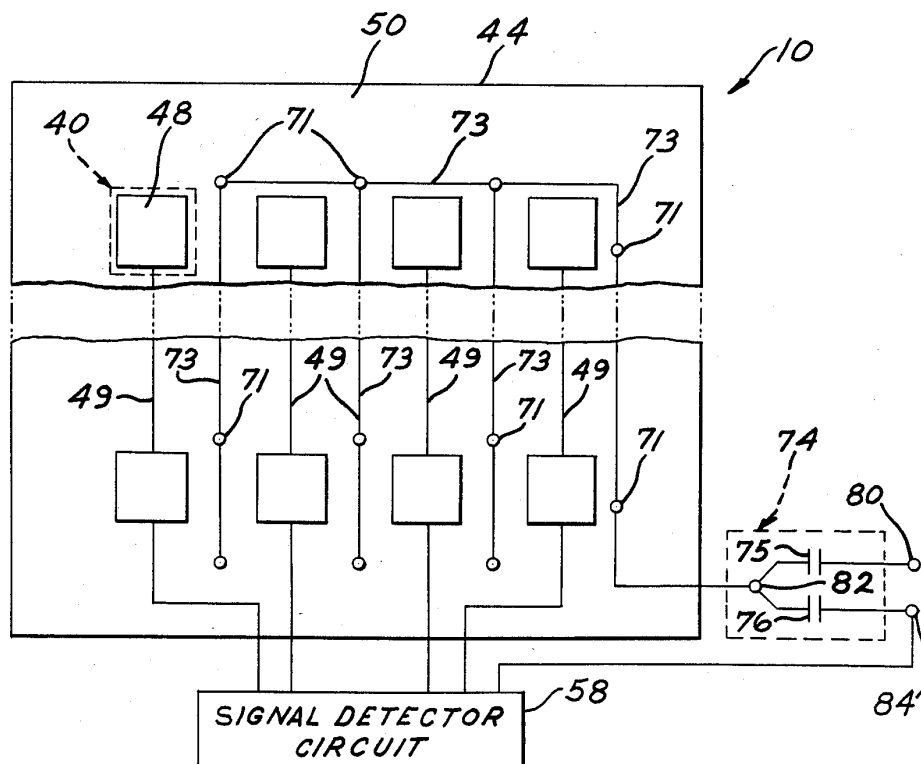


FIG. 5B



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