United States Patent [19]

Shimojo

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[54] **BINARY CODE GENERATOR**

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[58] **Field of Search** ..... 340/365 A, 365 R; 200/5 A, 159 B

[56] **References Cited**

UNITED STATES PATENTS

3,688,066	8/1972	Adelson	200/159 B
3,699,294	10/1972	Sudduth	200/159 B
3,600,528	8/1971	Leposavic	340/365 A
3,627,935	12/1971	Spierak	340/365 A
3,641,286	2/1972	Berezowski	200/5 A

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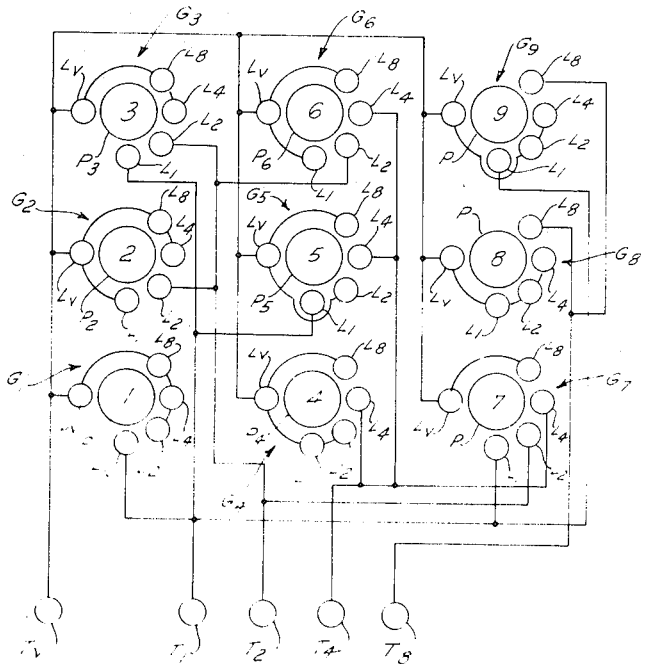
[57] **ABSTRACT**

A binary code generator for generating a plural bit binary code from keyboard input data comprises a printed circuit including a plurality of conductive lead groupings arranged in registration with a plurality of pushbuttons on a keyboard frame. The circuit board includes a plurality of electrical terminals one of which is operatively electrically connected to a voltage source and the others of which are selectively operatively electrically connected to the lead patterns forming the conductive lead groupings in accordance with the binary code to be generated. Upon actuation of the pushbutton switch all of the lead patterns in the conductive lead grouping associated with that pushbutton are electrically connected together whereby selected ones of the output terminals are electrically connected to the voltage source thereby to produce a binary output code.

The keyboard is formed of a single integral sheet of resilient material and includes a plurality of conductive resilient contacts normally spaced from the conductive lead groupings on the circuit board. In a preferred embodiment each of the lead patterns in a lead grouping comprises a plurality of radially extending branches and the contact member is formed with a contact surface in the form of a continuous generally circular rim adapted upon depression of its associated pushbutton to bridge a sufficient number of lead branches in the associated lead grouping to provide effective and reliable switching under all conditions. The contacts are electrically and structurally separated from each other by raised strips formed integral on the resilient keyboard sheet and secured by appropriate means to the circuit board, those strips being effective to reliably maintain independent actuation of individual pushbuttons.

2 Claims, 13 Drawing Figures