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930 O.G. 116

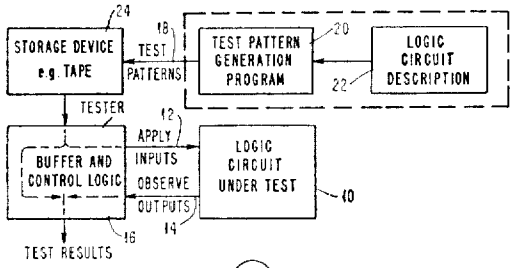
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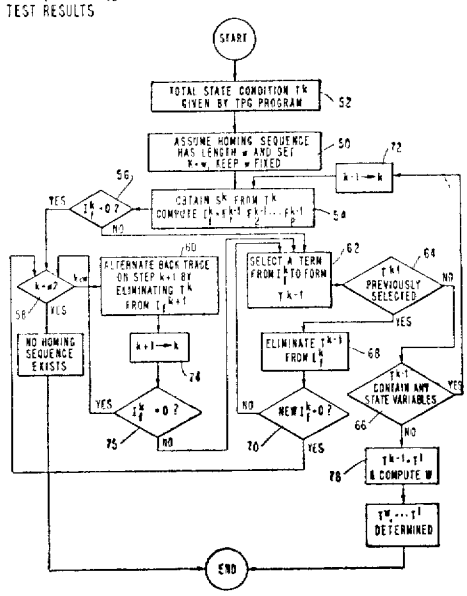
METHOD FOR PLACING AN ASYNCHRONOUS SEQUENTIAL CIRCUIT INTO A STATE FOR TESTING

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Continuation of abandoned application Ser. No. 265,035, June 21, 1972. This application Feb. 21, 1974, Ser. No. 444,449

Int. Cl. G06f *15/20*
U.S. Cl. 444—1
2 Sheets Drawing. 23 Pages Specification





A method for determining the homing sequence input patterns required to place any asynchronous sequential circuit into a set-state for testing is provided. The set-state is determined from the total states of an asynchronous sequential circuit generated by any test pattern generating machine, then deriving the total-state sequence from said set-state in a reverse order starting with the last total-state. The end of the total-state sequence is determined by recognizing the total-state in which there are no state variables. The total-state input patterns generated from this method are utilized in the forward order to place the asynchronous sequential machine into said set-state regardless of the initial state of said asynchronous sequential circuit.

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METHOD FOR PLACING AN ASYNCHRONOUS SEQUENTIAL CIRCUIT INTO A STATE FOR TESTING
Original Filed June 21, 1972 2 Sheets-Sheet 1

FIG. 1

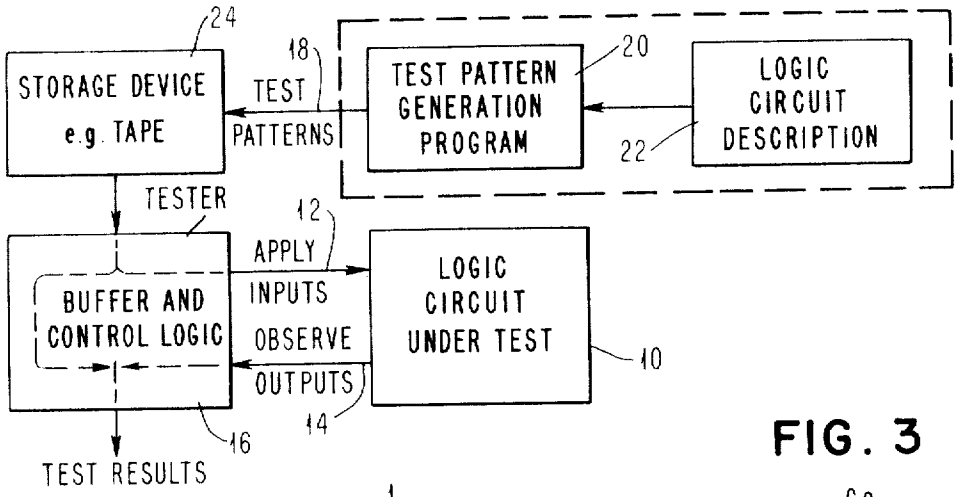


FIG. 3

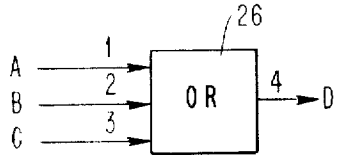
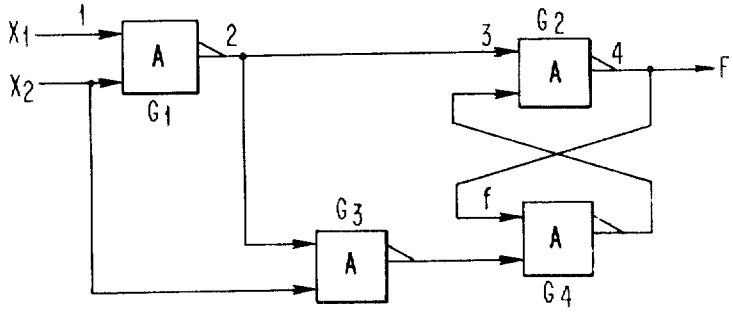


FIG. 2



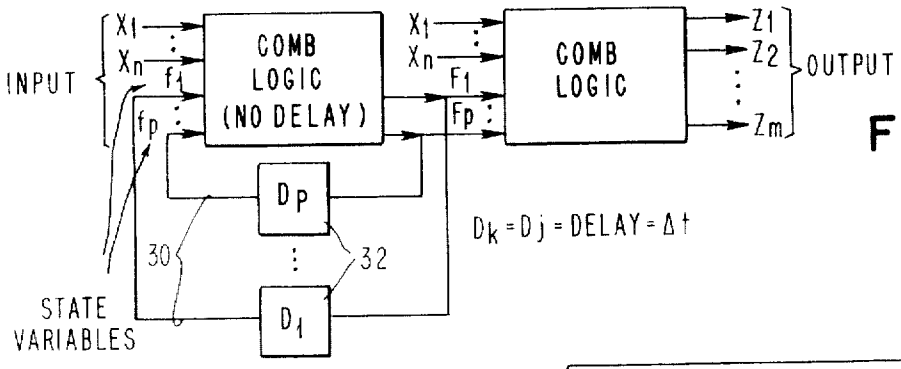


FIG. 4

FIG. 6

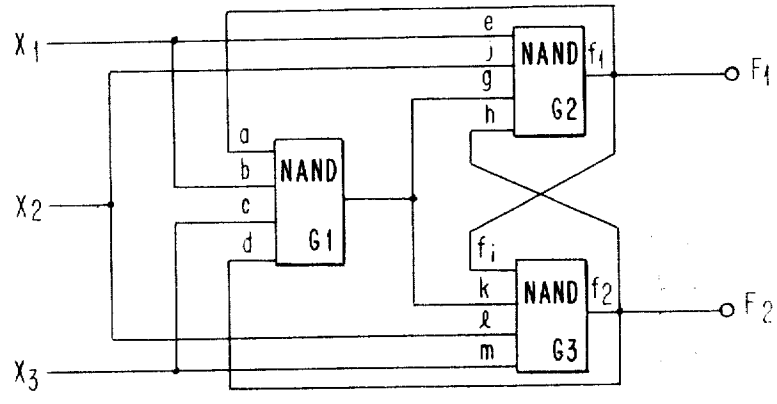
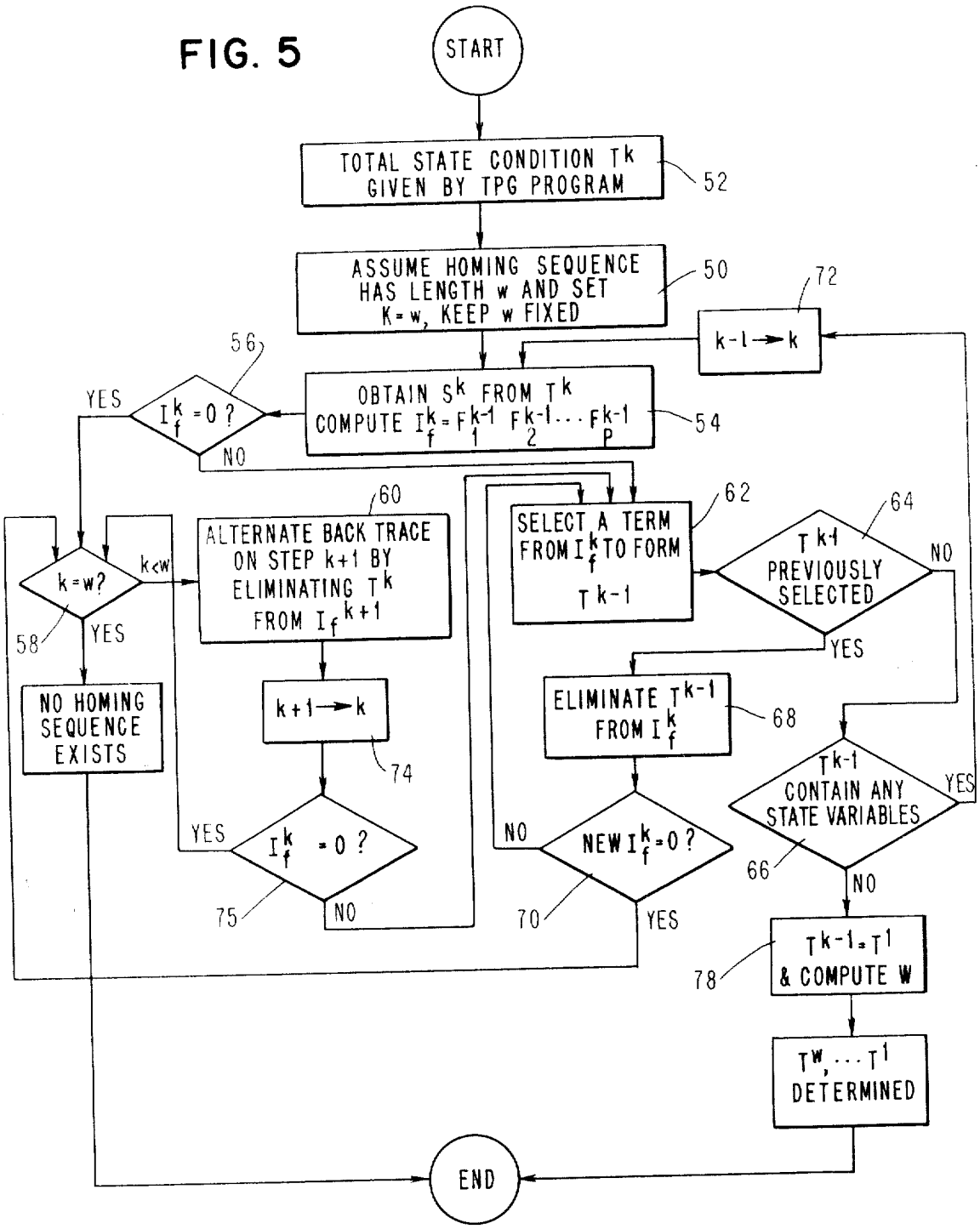


FIG. 5


START
TOTAL STATE CONDITION T^k GIVEN BY TPG PROGRAM
52
ASSUME HOMING SEQUENCE HAS LENGTH w AND SET K=w, KEEP w FIXED
50
72
k-1→k
56
YES
$I_f^k = 0$?
OBTAIN S^k FROM T^k COMPUTE $I_f^k = F_1^{k-1} F_2^{k-1} \cdots F_p^{k-1}$
54
NO
60
ALTERNATE BACK TRACE ON STEP k+1 BY ELIMINATING T^k FROM I_f^{k+1}
62
SELECT A TERM FROM I_f^k TO FORM T^{k-1}
64
T^{k-1} PREVIOUSLY SELECTED
NO
YES
k=w?
k<w
58
YES
NO HOMING SEQUENCE EXISTS
k+1→k
74
ELIMINATE T^{k-1} FROM I_f^k
68
T^{k-1} CONTAIN ANY STATE VARIABLES
YES
66
NO
YES
$I_f^k = 0$?
75
NO
NO
NEW $I_f^k = 0$?
70
YES
$T^{k-1} = T^1$ & COMPUTE W
78
$T^w, \cdots T^1$ DETERMINED
END