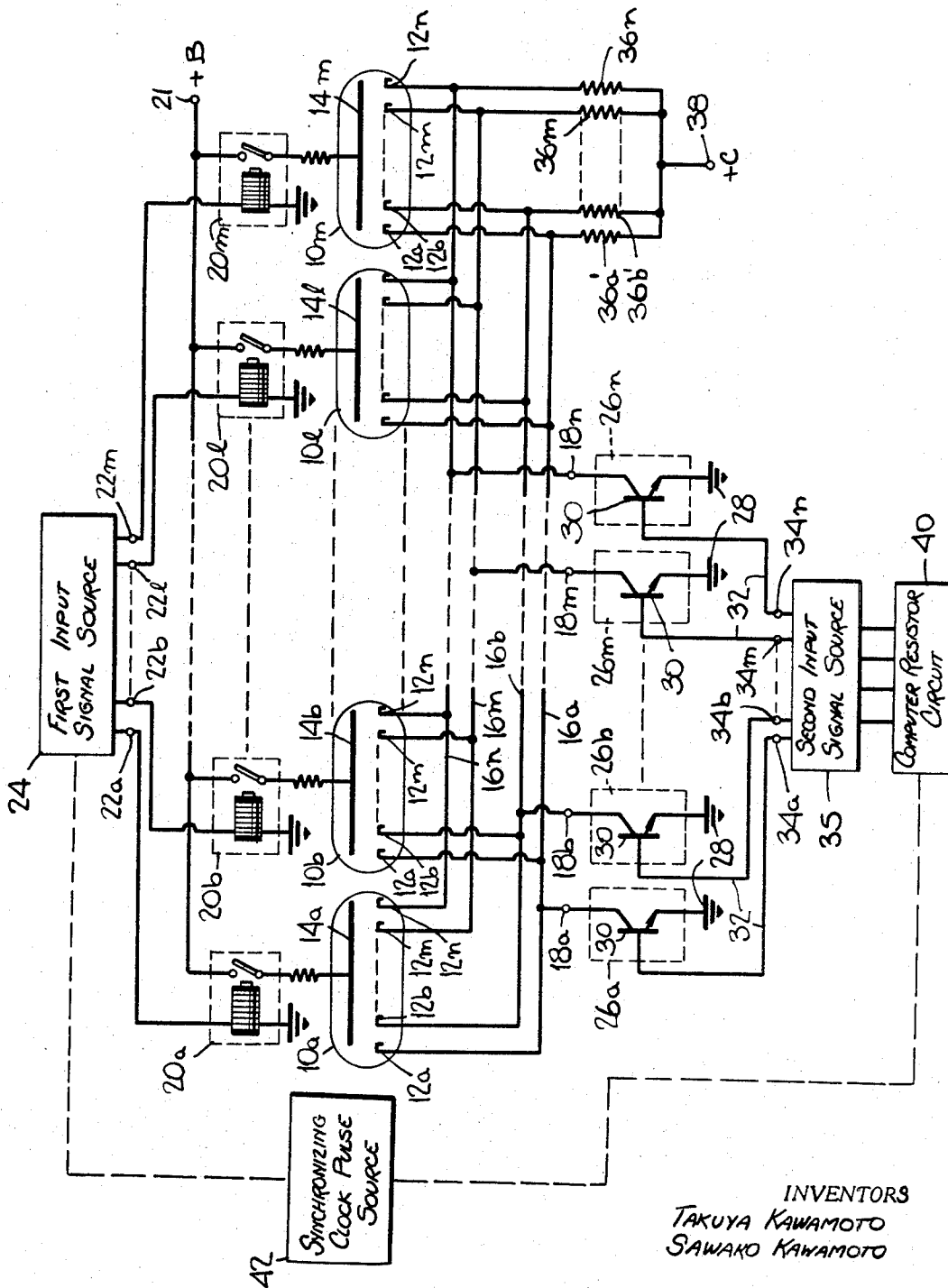


Dec. 3, 1968

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3,414,764

CIRCUIT FOR CONTROLLING THE DISPLAYING OF SELECTED INDICIA BY
INDICATOR TUBES IN A DISPLAY SYSTEM FOR ELECTRONIC
COMPUTERS AND THE LIKE
Filed March 14, 1966



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CIRCUIT FOR CONTROLLING THE DISPLAYING OF SELECTED INDICIA BY INDICATOR TUBES IN A DISPLAY SYSTEM FOR ELECTRONIC COMPUTERS AND THE LIKE

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Filed Mar. 14, 1966, Ser. No. 534,244

Claims priority, application Japan, Mar. 15, 1965, 40/15,164

5 Claims. (Cl. 315—84.6)

ABSTRACT OF THE DISCLOSURE

In a display system for electronic computers and the like which comprises a number of indicator tubes, such as cold cathode tubes, each having a plurality of cathode electrodes respectively configured to indicate particular indicia and an anode electrode common to all cathode electrodes in the same tube, each cathode electrode in each tube is connected together with the correspondingly configured cathodes in the other tubes to a respective first switching device and the anode electrode of each tube is connected individually to a respective second switching device, the first switching devices are selectively actuated in sequence, and the second switching devices are selectively actuated in sequence and in synchronism with the actuation of the first switching devices.

This invention relates to display systems, and is particularly suited for use as a time divisional, or sequential, display system for electronic computers.

Prior art display systems for electronic computers employing conventional indicator tubes have required the use of a separate circuit or drive means for each individual tube in order to display a particular numeral on the tube.

According to the present invention, there is provided an arrangement including a plurality of indicator tubes. Each tube has a plurality of cathode electrodes, specially configured for indicating different numerals, letters or other characters or indicia. Each tube additionally has a single anode electrode which is common to all of the cathode electrodes of the respective tube. The indicator tubes are selectively caused to display the numerals, letters or other characters in a time sequential or time divisional manner, and common drive or circuit means are used in connection with the tubes, thereby simplifying the structure of the entire apparatus.

It is an object of the present invention to provide an improved and simplified display system.

It is another object of this invention to provide a display system for electronic computers which includes switching circuits but which is of simplified construction, and which utilizes simplified circuit arrangements.

It is another object of this invention to provide a display system for electronic computers in which certain switching circuits can be connected in common to a plurality of indicator tubes for displaying numerals, letters or characters of the tubes in accordance with applied signals, such system being simple in structure but reliable in operation.

It is still another object of this invention to provide a display system for electronic computers in which a bias voltage is applied to connecting points between switching circuits and cathode electrodes of indicator tubes for displaying numerals, letters or characters so as to ensure accurate operation of the indicator tubes.

Other objects, features and advantages of this in-

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vention will become apparent from the following description taken in conjunction with the accompanying sheet of drawing which illustrates an example of the display system according to this invention.

One example of the display system of this invention will hereinafter be described in detail with reference to the drawing wherein:

The figure is a schematic circuit diagram illustrating a system embodying the present invention.

As shown in the drawing, there are provided a plurality of cold cathode indicator tubes 10a, 10b . . . 10m. Each tube includes a multiplicity of cathode electrodes 12a, 12b . . . 12n. The electrodes are individually arranged and configured to indicate, when placed in circuit, a different numeral, letter or other character. Each tube additionally includes a common anode 14a, 14b . . . 14m.

In the present embodiment the corresponding cathode electrodes are connected together to common lines 16a, 16b . . . 16n. Thus the cathode electrode 12a of each tube is connected to the common line 16a, while each cathode electrode 12b is connected to the common line 16b, and so forth. Each common line 16a, 16b . . . 16n leads to a corresponding terminal 18a, 18b . . . 18n.

The common anodes 14a, 14b . . . 14m of the various indicator tubes 10a, 10b . . . 10m, are connected in circuit with associated switch means 20a, 20b . . . 20m. These switch means, when closed, connect the associated indicator tube anodes 14a, 14b . . . 14m to a terminal 21 which receives a positive voltage from an external source (not shown). The switch means 20a, 20b . . . 20m, are connected to corresponding terminals 22a, 22b . . . 22m of a first input signal source 24. Additional switching means 26a, 26b . . . 26n, are provided in circuit with each of the common lines 16a, 16b . . . 16n at their terminals 18a, 18b . . . 18n. These additional switching means, when activated, connect the terminals 18, and hence the corresponding cathode electrodes 12 of the various indicator terminals to ground as indicated at 28. These additional switching means as shown, may consist of transistors 30. In any event they are energized by means of signal lines 32 connected to corresponding terminals 34a, 34b . . . 34n of a second input signal source 35. Proper bias for the transistors 30 is provided by means of resistors 36a, 36b . . . 36n connected between associated common lines 16a, 16b . . . 16n and a terminal 38 to which a positive voltage source (not shown) is connected.

In practice, the present invention is applicable to the numerals display portion of an electronic computer; and in such case the cathode electrodes 12 of each indicator tube 10 are ten in number and are arranged to indicate the numerals "0" to "9." Accordingly, the second input signal source 35, which operates the additional switching means 26, takes the form of a code decimal signal output translating circuit for producing decimal signal outputs on its various terminals 34. This translating circuit would include a decade counter and a matrix circuit and it would, as shown, be connected to a resistor circuit 40 of an electronic computer.

The switch means 20, which are shown as relays, may also consist of transistors.

The first input signal source 24 serves to determine which indicator tube becomes connected into circuit. The source 24 may take the form of a counter so that its output terminals 22 are energized in a predetermined sequence.

The first and second input signal sources 24 and 35 are synchronously energized in such a manner that when their associated switching means 20 and 26 are individually closed at predetermined intervals, particular tubes

10 are activated to indicate particular numbers in a particular sequence. This sequence of numbers corresponds to the relationship between the outputs of the first and second signal sources 24 and 35. As shown, there may be provided a synchronizing clock pulse source 42 connected to supply synchronizing signals to the first and second input signal sources 24 and 35.

With the above described arrangement, since the first signal source 24 and the second signal source 35 sequentially drive the switching means 20 and 26 in synchronism as by means of clock pulses, a particular indicator tube 10 is ignited which is simultaneously energized by both the first and second input signal sources. That is, the cathode indicator electrodes of the indicator tubes can sequentially be caused to glow in a time divisional manner. Also, even though several of the cathode electrodes 12 of the indicator tubes 10 are connected to the same switching means 26, only a particular indicator tube is caused to glow corresponding to a closed one of the other switching means 20.

At the same time, since the drive circuits for the indicator tubes, i.e., the switching means 26 are used in common with several tubes, the over-all circuit and drive means can be extremely simplified.

It will be apparent that many modifications and variations may be effected without departing from the scope of the novel concepts of this invention.

What is claimed is:

1. A display system comprising a plurality of indicator tubes each having an anode electrode and a plurality of cathode electrodes, means for connecting corresponding cathode electrodes of said indicator tubes to each other, first drive means for causing one group of connected cathodes to glow, second drive means connected to each of said anode electrodes and arranged to selectively apply a current to different ones thereof in sequence, and means for synchronously controlling said first and second drive means to cause one of said cathodes of any indicator tubes to glow.

2. A display system comprising a plurality of indicator tubes each having an anode electrode and a plurality of cathode electrodes, means for connecting each cathode electrode of one of said indicator tubes to a correspond-

ing cathode electrode of each of said other indicator tubes, first drive means for causing one of said cathodes to glow, second drive means connected to each of said anode electrodes for selectively applying a current thereto, means for applying a signal of a computer output resistor circuit to said first drive means, and means for applying a signal for selecting the unit of display to said second drive means.

3. A display system as in claim 2 including means for synchronizing signals from the output resistor circuit and the signals for selecting the unit of display.

4. A display system as claimed in claim 1 wherein the first drive means comprises transistors and means for applying a bias to their connections with the cathode electrodes.

5. A display system comprising a plurality of electronically energized indicator devices, each device having a single first terminal and a plurality of second terminals to provide different indications according to the particular second terminal which becomes connected in circuit with the first terminal, means connecting the corresponding second terminals of each of said indicator devices to common lines, first switch means in circuit with each first terminal, second switch means in circuit with each of said common lines and means for sequentially actuating each of said first switch means and for sequentially actuating each of said second switch means, the actuation of said first and second switch means being mutually synchronized.

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