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Hankins et al.

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[54] **DARK TRACE CATHODE RAY TUBE ERASE SYSTEM**

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[52] **U.S. Cl.** ..... **315/323,** 315/241 P, 315/315

[51] **Int. Cl.** **H05b 41/36**

[58] **Field of Search** ..... 315/313, 315, 323, 315/241 R, 241 P, 241 S

[56] **References Cited**

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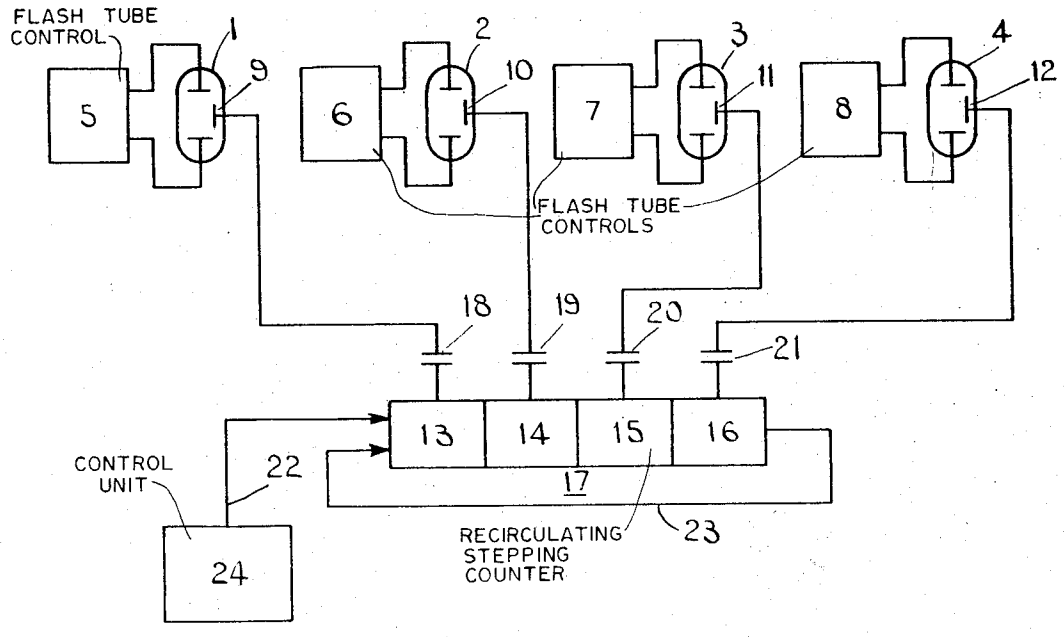
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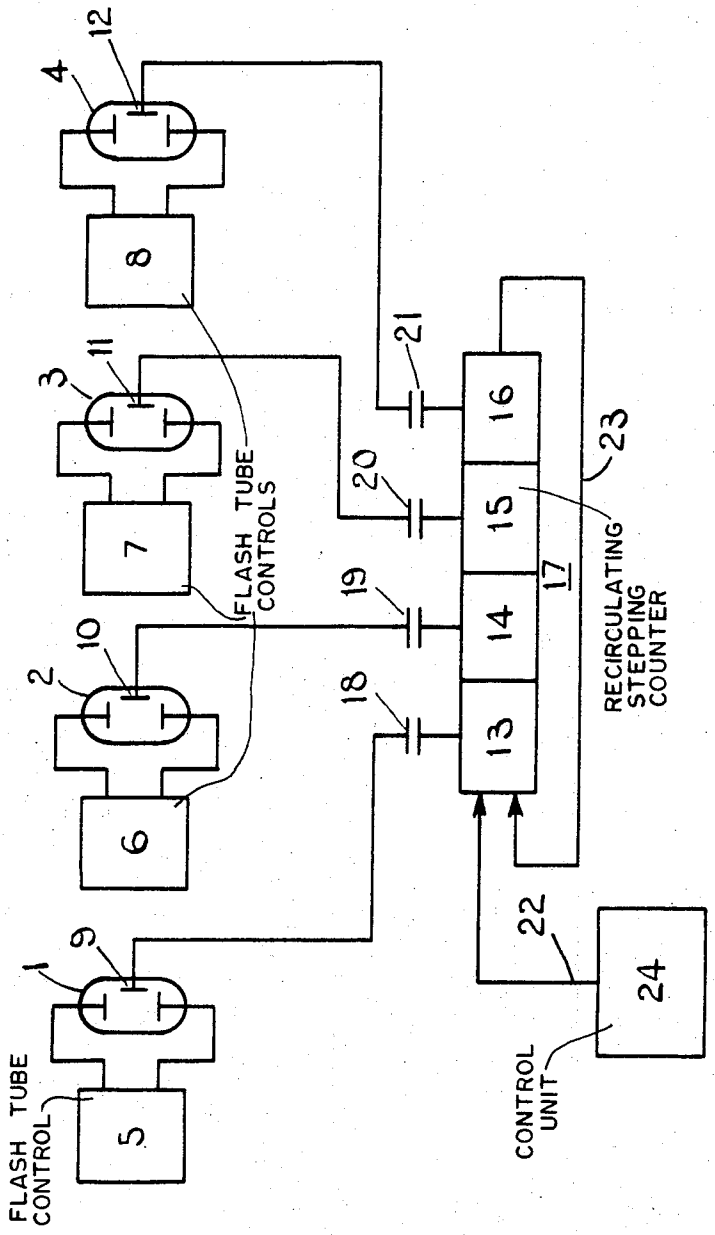
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[57] **ABSTRACT**

A flash erasure system for erasing the display on a dark trace cathode ray tube. The system includes a number of flash tubes wich can be selected for operation in a predetermined sequence. This mode of operation allows a cooling and charging period for each tube before it is required to be used again.

1 Claim, 1 Drawing Figure




12
4
8
11
3
7
10
2
6
9
1
5
FLASH TUBE CONTROL
FLASH TUBE CONTROLS
21
20
19
18
16
15
14
13
17
23
RECIRCULATING STEPPING COUNTER
22
24
CONTROL UNIT

DARK TRACE CATHODE RAY TUBE ERASE SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to information processing apparatus utilizing dark trace cathode ray tubes for information storage or display for computers, and in particular to erasing devices for such tubes.

It has previously been proposed to erase the image displayed on the face of a dark trace cathode ray tube by exposing the face to heat obtained from, for, example, a photoflood lamp. A tendency has also previously been noted that such erasure is obtainable from a single flash tube. However, where erasure is required at a high cyclic frequency such a single flash tube is not suitable as an erasure device since it requires a fairly lengthy period between flashes in order for the tube to become cool and for an associated driving capacitor to be recharged.

SUMMARY OF THE INVENTION

According to the present invention information processing apparatus utilizing a dark trace cathode ray tub and a trace erasing device includes a plurality of flash tubes; circuit means associated with each flash tube including a capacitor connected across the tube; means for charging the capacitors at a predetermined rate; and erasing control means operable to apply a triggering signal to each tube in a predetermined sequence, each tube being responsive to the triggering signal to produce a flash.

BRIEF DESCRIPTION OF THE DRAWING

Apparatus embodying the present invention will now be described, by way of example, with reference to the accompanying drawing which shows in schematic form a trace erasing device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing, four flash tubes **1, 2, 3, 4** are connected respectively to flash tube control circuits **5, 6, 7, 8.** The control circuits each include a capacitor and a resistor and are similar to conventional circuits that are used to operate electronic flash guns in the photographic field. The trigger electrodes **9, 10, 11, 12** of the four flash tubes are connected one to each of the four stages **13, 14, 15, 16** of a recirculating stepping counter **17** through four capacitors **18, 19, 20, 21.** Each of the stages of the stepping counter is bistable and the arrangement is such that one stage is in a first state and the other three stages are in the opposed state. Stepping signals are applied to the counter on line **22** and a recirculating line **23** enables the state of stage **16** to be stepped on to stage **13.** The stepping signals are derived from a control unit **24,** and will be referred to hereafter as erase signals. It will be understood that the flash tube control circuits **5, 6, 7, 8,** the recirculating stepping counter **17** and the control unit **24** share a common power source (not shown) and therefore have a common earth connection.

In operation, when the device is switched on the recirculating stepping counter is forcibly reset so that, for example, stage **13** is set to the first state and the other three stages are set to the opposed state. An erase signal from the control unit **24** over line **22** to the counter **17** is effective to cause the first state to be stepped from stage **13** to stage **14.** As stage **14** of the counter switches to the first state a stepped waveform is applied to capacitor **19** which produces a pulse on the appropriate trigger line effective to cause the flash tube **2** to produce a single flash in the conventional manner. Each subsequent erase signal steps on the first state by one stage in the counter with the result that the flash tubes **3,4, 1, 2** are triggered in turn in cyclic order. It will be realised that after each operation of any one of the flash tubes the driving capacitor which is contained in the associated flash tube control circuit is recharged in the conventional manner in readiness for the next occurring triggering signal at the appropriate trigger electrode.

By using a number of flash tubes in the way described it is possible to ensure that unwanted heat is dissipated from each tube before it is required for re-use after it has once been used. The number of flash tubes provided is chosen in dependence upon the frequency of erasure required. Provision of a number of flash tubes also enables a conservative charging current to be used for the flash tube driving capacitors. It has been found that using the arrangement of four flash tubes as described enables a display tube to be used to display information which is regenerated at a frequency of some five to eight cycles a second, for example, which is sufficient to produce a visually stable display, and in which the information has been modified on each successive display cycle. The provision of the required number of flash tubes together with the triggering signal cyclic distribution described enables the displayed information to be erased at the end of each display cycle, so that the displayed information may be constantly changing, and this continual modification is then possible without significant reduction in the repetition rate of the display cycles.

We claim:

1. A dark trace cathode ray tube erase system, comprising a plurality of flash tubes each having a triggering electrode and disposable to erase a dark trace cathode ray tube; a recirculating stepping counter having a counter stage for each said tube; the output of each stage being connected to a triggering electrode of the associated tube and arranged such that when any stage of the counter is in a first state in which it is able to apply a triggering pulse to its associate tube to cause the latter to produce a flash, the remaining stages are forced into the opposed state; and a control unit for applying stepping pulses to the counter to cause the latter to apply a triggering signal to each tube in a predetermined sequence.

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