United States Patent [19]

Nagai

[11] 3,728,712

[45] Apr. 17, 1973

[54] VIDEO FILE APPARATUS FOR DISPLAYING AND STORING DATA FROM PLURAL DOCUMENTS IN SUPERPOSITION

[75] Inventor: **Hiroshi Nagai**, Chigasaki, Japan

[73] Assignee: **Hitachi, Ltd.**, Tokyo, Japan

[22] Filed: **Dec. 31, 1970**

[21] Appl. No.: **103,071**

[52] **U.S. Cl.** .....**340/324 A**, 178/DIG. 6

[51] **Int. Cl.**.....**G06f 3/14**

[58] **Field of Search**.....178/DIG. 6, 6.6, 178/6.6 R, 6.6 DD, 6.6 HS, 6.6 SF; 340/324 A, 152, 154

[56] **References Cited**

UNITED STATES PATENTS

3,569,617	3/1971	Allen	178/6.6 DD
3,465,097	9/1969	Brabon et al.	178/DIG. 6
3,580,993	5/1971	Sandorf et al.	178/DIG. 6
3,345,458	10/1967	Cole et al.	340/324 A
3,396,377	8/1968	Strout	340/324 A
3,579,249	5/1971	Dewey et al.	178/DIG. 6

Primary Examiner—John W. Caldwell

Assistant Examiner—Marshall M. Curtis

Attorney—Craig, Antonelli & Hill

[57] **ABSTRACT**

A video file apparatus includes a recycling type of video-signal storage device, a video-signal generating source, a display device, and a synchronizing-signal generator circuit for causing each of said video-signal storage device, said video-signal generating source and said display device to operate in synchronism with each other, wherein a video signal being supplied from said video-signal storage device to said display device is displayed, replaced by and superposed on a video signal from said video-signal generating source at a predetermined time and the video signal in superposed form is stored in said video-signal storage device.

4 Claims, 8 Drawing Figures

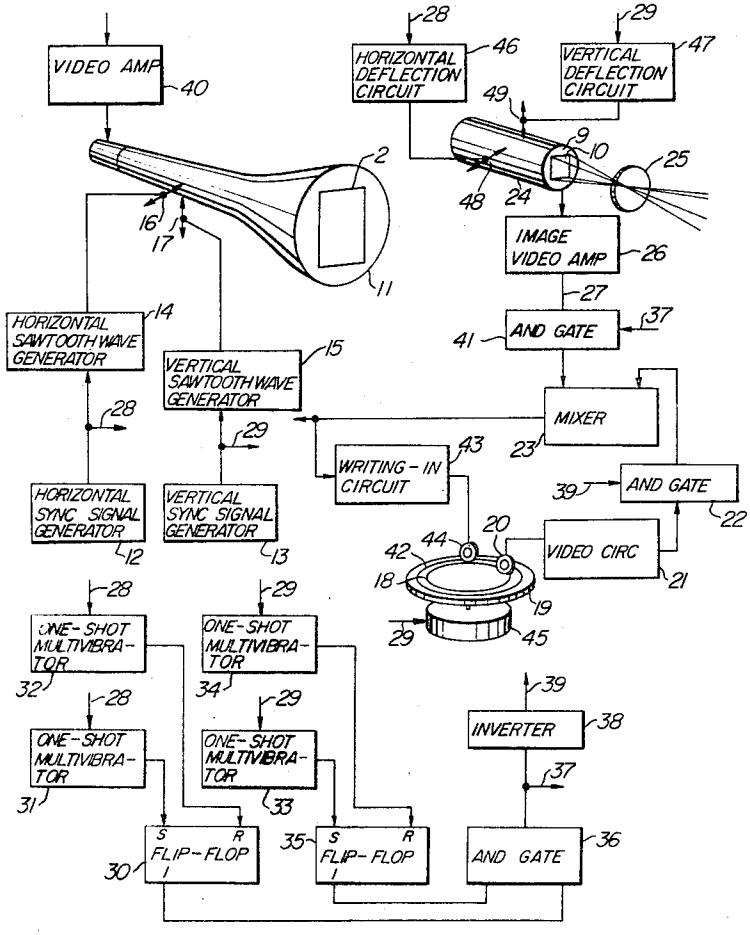


FIG. 1

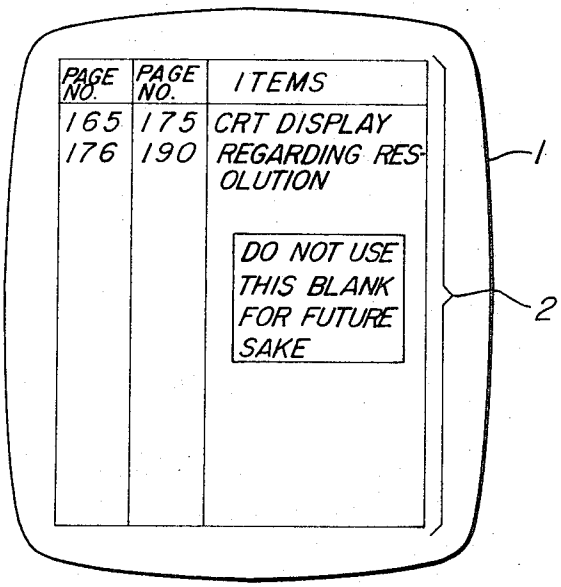


FIG. 2

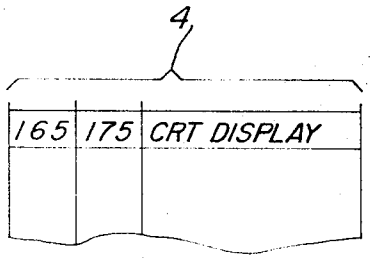


FIG. 3

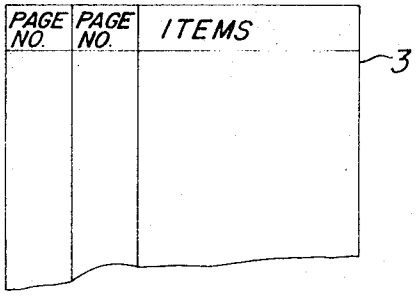
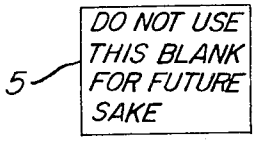


FIG. 4



INVENTOR

HIROSHI NAGAI

BY Craig, Antonelli, Stewart & Hill

ATTORNEYS

FIG. 5

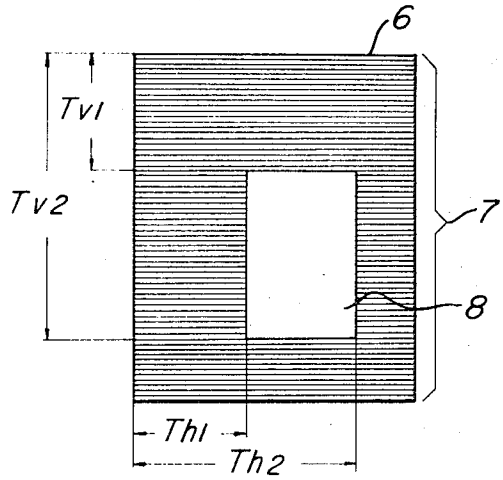


FIG. 6

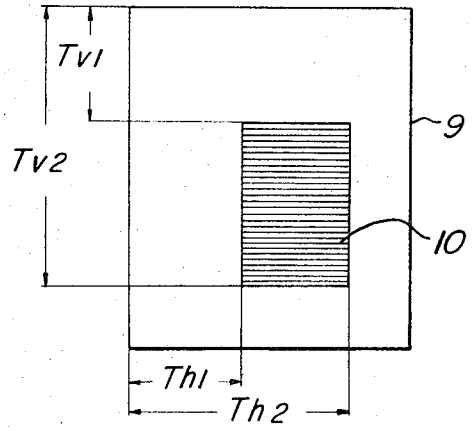
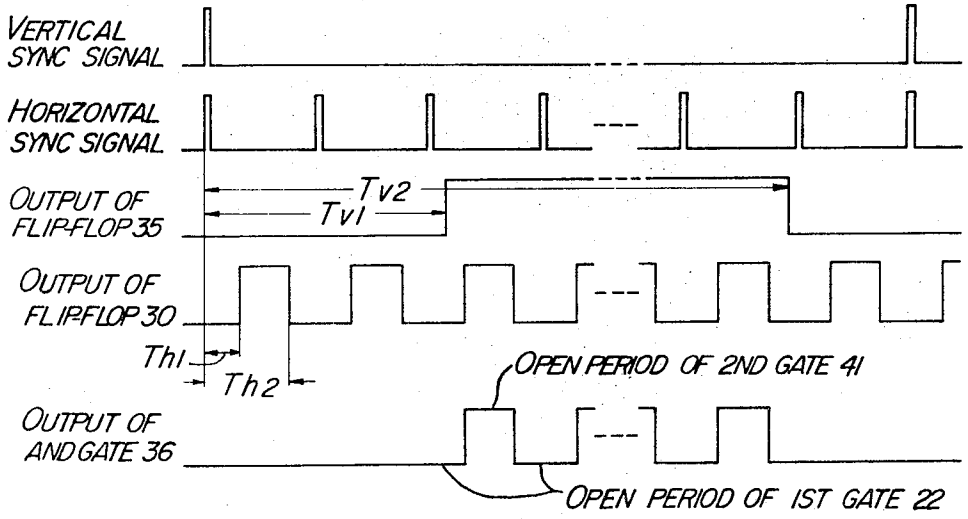


FIG. 8



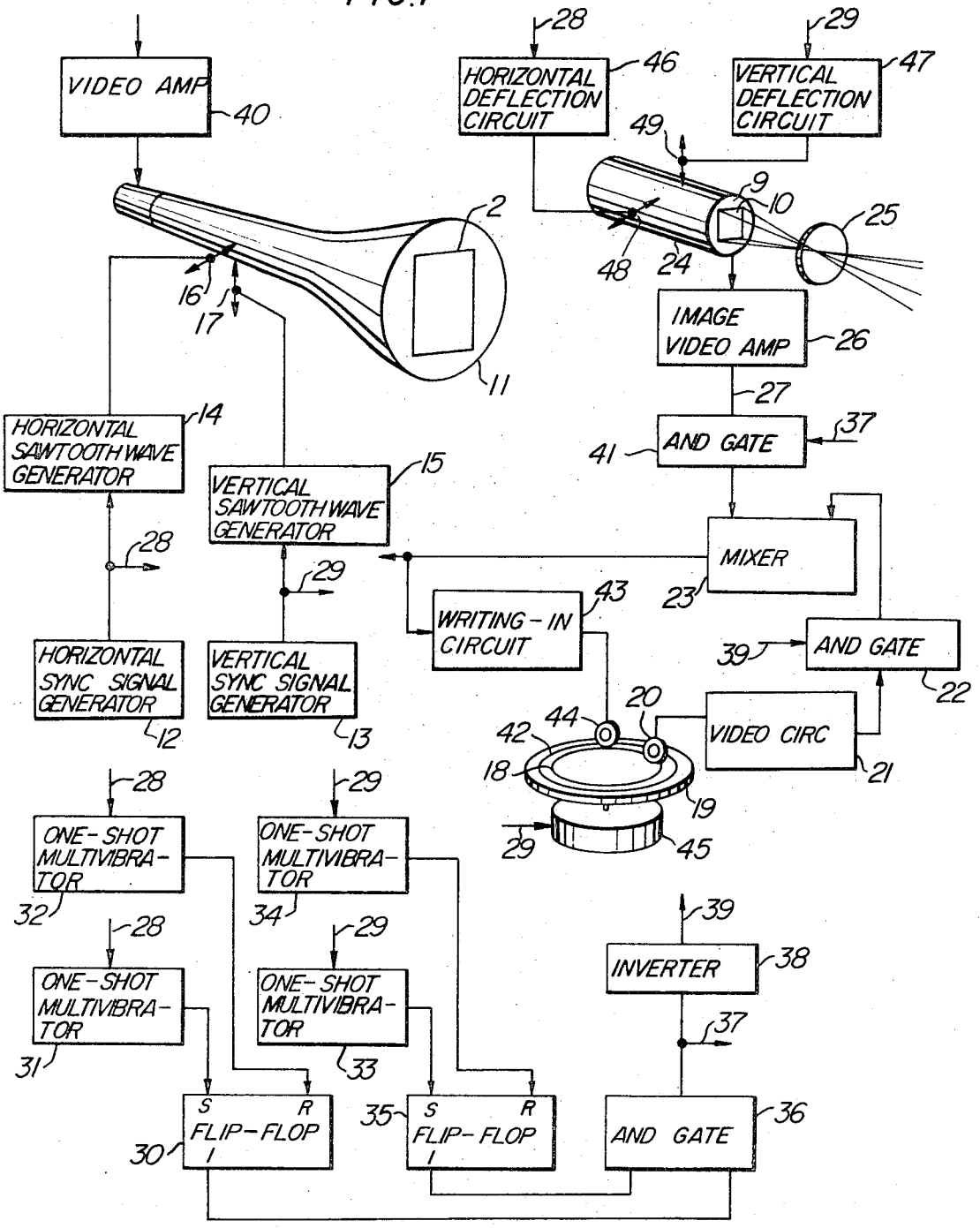
INVENTOR

HIROSHI NAGAI

BY Craig, Antonelli, Stewart & Hill

ATTORNEYS

FIG.7



INVENTOR

HIROSHI NAGAI

BY Craig, Antonelli, Stewart & Hill

ATTORNEYS

VIDEO FILE APPARATUS FOR DISPLAYING AND STORING DATA FROM PLURAL DOCUMENTS IN SUPERPOSITION

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a video file apparatus for displaying and storing the data from plural documents in superposition. More particularly, it relates to a video file apparatus which is capable of altering its contents as a stationary picture recorded on a recording medium is being displayed on a display device.

2. Description of the Prior Art

In ancient times when no money existed, articles wanted by various persons were bartered by mutual agreement as to their interchangeable amount and value. Accordingly, the exact value of the article varied according to circumstance was not fixed. When money appeared, the value being generallized, standardization of the value was promoted thereby. At present, further progress is being made to construct a so-called "-cashless society" in which money is not carried about, but the amount of money is recorded in a file such as for a computer, so that account may be settled on the basis of confidence in the recording. In addition, remittances etc. are transmitted in the form of data, and no cash actually moves. Thus, economic activities are now conducted without using real money.

Such an idea and the embodiment thereof, it may be considered, will follow a similar tendency in the case of information. More specifically, among various sorts of information, particularly literature and documents and the like are in the material form at present. They are circulated as if articles were handled or cash were used. It is the microfilm that has been developed with the thought of possible convenience through a reduction of size. However, even the microfilm is a mere reduced thing and is physical, so that handling is difficult for mechanization. Furthermore, it is in no way possible to change the information which has once been made into a microfilm.

In place of the microfilm and the like, Videofile (trade mark, AMPEX Corp.), an apparatus utilizing the video tape recording technique has been recently suggested in order to make documents invisible and exclude the mechanical handling thereof, and further, to reduce the volume for recording, enable alteration of contents and provide an immediate treatment attended with none of the development process, etc. Since the apparatus satisfies all the above-mentioned functions, it is easy to rewrite the entire page of a document. In such case of making a list, however, sequential additions of changes to a part of a picture, for example, are impossible in any direct way. For these changes, such an indirect way is unavoidable that they are written on a piece of paper and are subject to video recording each time the list is altered.

SUMMARY OF THE INVENTION

An object of this invention is to provide a video file apparatus which does not require rewriting of the recording to alter the contents.

Another object of this invention is to provide a video file apparatus which is capable of freely altering the contents at an optional part of a displayed picture.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a diagram showing a display screen of a cathode-ray tube after alteration of the contents as has been carried out in accordance with this invention;

FIGS. 2 to 4 are diagrams showing examples of the contents of information as are intended to be added to a displayed picture;

FIGS. 5 and 6 are diagrams for explaining the principle of this invention;

FIG. 7 illustrates an embodiment of this invention partly in a perspective view and partly in a block diagram; and

FIG. 8 is a time chart for explaining the embodiment in FIG. 7.

DESCRIPTION OF THE PREFERRED EMBODIMENT:

Description will now be made with reference to the accompanying drawings.

FIG. 1 shows a display screen 2 after the contents displayed on a cathode-ray tube (CRT) 1 have been subjected to changes. According to this invention, only a format 3 illustrated in FIG. 3 is first recorded. The format 3 represents PAGE NOs. and ITEMS only, and contains no contents thereof. In the second step, information 4 shown in FIG. 2 is recorded in superposition on the format 3 having been already transcribed, without changing the latter. The information 4 does not contain the format 3 including the PAGE NOs., ITEMS etc., but it only consists of one as really desired to be added. Accordingly, the format 3 is recorded once only. This differs from an image transcription in which the format 3 having been previously recorded is erased to record anew a format 3 added to the information 4. In such case, the format 3 having been previously written should be left as a copy on a piece of paper. This is contradictory to the spirit of this invention that no documents are materially left behind. An object of this invention is to add only the desired contents to information having been already recorded or changed the stored information merely by writing the new contents on a piece of paper by hand, thus fully eliminating the necessity for keeping a copy or a manuscript after an image transcription for addition or alternation. The nature of this invention will be explained in connection with the following example for ease of understanding. In this example, an information 5 with a certain area as illustrated in FIG. 4 is intended to be added to the information having already been recorded to complete a modified information display as shown in FIG. 1. To this end, as shown in FIG. 5, a part of a displayed picture 7 composed of a number of rasters 6 is left so that any video signal is not added thereto for a certain period of time. Thus, a blank portion 8 is formed. The information 5 to be substituted into or added to the portion 8 for the period is transcribed in a target scanning section 9 (FIG. 6) of an image pickup tube. Then, a video signal obtained at a scanning part 10 (FIG. 6) corresponding to the blank part 8 is added to the displayed picture. In order to embody this treatment, an arrangement as in FIG. 7 may be carried out.

Referring to FIGS. 7 and 8, a cathode-ray tube 11 for display has circuits 14 and 15, for respectively generating horizontal and vertical sawtooth waves, driven by a

horizontal synchronizing-signal generator circuit **12** and a vertical synchronizing-signal generator circuit **13**, respectively. Outputs from the saw-tooth wave generator circuits **14** and **15** are respectively applied to a horizontal deflector **16** and a vertical deflector **17**. The cathode-ray tube thereby displays the rasters **6** as seen in FIG. **5**. A video signal is read out into a video circuit **21** through a head **20** from a disc **19** which is kept rotating in synchronism with the horizontal and vertical synchronizing-signal generators **12** and **13** by a motor **45** and which has had images transcribed on a track **18**. The video signal is then applied to a video amplifier **40** via a gate **22** as well as a mixer circuit **23**. An output from the video amplifier **40** is applied to the cathode-ray tube **11** to effect brightness modulation, so that rasters form the display screen **2**. The disc **19** may be represented as a recycling type of video-signal storage device.

On the other hand, a television camera tube **24** for photographing the information **5** to be added as in FIG. **4** converts an optical image falling upon the target **9** by a lens **25**, into a video signal **27** by means of an image video amplifier **26**. In this case, the television camera tube **24** has horizontal synchronizing pulses **28** and vertical synchronizing pulses **29** respectively applied to a horizontal deflection circuit **46** and a vertical deflection circuit **47** of the tube **24** and to horizontal and vertical deflectors **48** and **49**, so as to scan the target **9**. In order that the display screen **2** of the cathode-ray tube **11** may provide the blank part **8** as illustrated in FIG. **5**, the circuit arrangement is operated as follows. The horizontal synchronizing pulse **28** is applied to a one-shot multivibrator **31** which, upon receiving it, provides a pulse for setting a flip-flop **30** after a time lag of Th_1. The horizontal synchronizing pulse **28** is further applied to a one-shot multivibrator **32** which, upon reception generates a pulse for resetting the flip-flop **30** after a time delay of Th_2. Similarly, the vertical synchronizing pulse **29** is applied to one-shot multivibrators **33** and **34** respectively having time delays Tv_1 and Tv_2 as shown in FIG. **5**. Outputs from the multivibrators **33** and **34** set and reset a flip-flop **35**, respectively. It is to be understood that when outputs from the flip-flops **30** and **35** are applied to an AND gate **36**, a period in which it provides the level of an output **37** is equal to the period of the blank part **8** in FIG. **5**. An output **39** obtained by passing the output **37** through an inverter **38**, is at the null level just for the period of the blank part **8**. When the output **39** is applied to the gate **22**, the video signal read out from the track **18** will be blocked by the gate **22** and will not reach the video amplifier **40** via the mixer circuit **23** being an OR circuit, insofar as the output **39** is at the null level. Thus, no picture appears on the display screen of the cathode-ray tube **11**, and the blank part **8** is formed as in FIG. **5**. The rasters **6** running through the blank part **8** are not subjected to brightness modulation at all.

On the other hand, scanning beams run on the target **9** of the image pickup tube **24**. Only during the period in which the level of the output **37** is not null, i.e., during the period of the blank part **8** in FIG. **5**, is a gate **41** opened so that the video signal **27** generated in the image pickup tube **24** is delivered to the mixer circuit **23**. Thus, the optical image focused on the scanning part **10** corresponding to the period of the blank part **8** is displayed on a place corresponding to the blank part **8** of the cathode-ray tube **11**. Accordingly, if the information as desired to be substituted is projected in the scanning part **10**, it will be inserted into the image having been already transcribed in the track **18**. In case where it is desired to transcribe the image after substitution, it may be written in a further track **42** through a writing-in circuit **43**. Further, in order to transfer the contents of the track **42** to the track **18**, it is possible, by way of example, to move the head **44** onto the track **18** for the intended image transcription. As apparent from the above description, only a part as desired to be altered may be replaced through photographing an image by the image pickup tube **24**.

It is to be understood that the position and size of the picture **5** to be inserted may be freely varied by adjusting the time lags of the four one-shot multivibrators **31**, **32**, **33** and **34** from the horizontal and vertical synchronizing pulses **28** and **29**. It is accordingly possible to arrange a number of one-shot multivibrators respectively having different time delays, in order to select the most suitable ones among the one-shot multivibrators dependent upon the position and size of the picture **5** to be inserted.

As will be clearly understood upon reading the above detailed description, the aspects of performance of this invention reside in the following:

1. A video file apparatus capable of optionally altering its contents, characterized in that as a stationary picture recorded on a recording medium is being displayed, a part of the picture which may be designated with its position and area being variable, has not the picture from said recording medium displayed thereon, but has a stationary picture from another device displayed thereon.

2. A video file apparatus capable of optionally altering its contents, characterized in that as a stationary picture recorded on a recording medium is being displayed, a part of the picture which is designated with its position and area being variable, does not have the picture from said recording medium displayed thereon, but has a stationary picture from another device displayed thereon, the position and area of said part to be designated being determined by periods of time from horizontal and vertical synchronizing signals.

I claim:

1. A video file apparatus comprising a synchronizing-signal generator circuit, a display device which operates in synchronism with synchronizing signals from said synchronizing signal generator circuit, a recirculating type of video-signal storage device synchronized with said signals from said synchronizing-signal generator circuit, a video-signal generating source synchronized with said signals from said synchronizing-signal generator circuit, a first gate for supplying a video signal from said video-signal storage device to said display device and back to said video-signal storage device, a second gate for supplying a video signal from said video-signal generating source to said display device and said video-signal storage device, and control means operated by said synchronizing-signal generator circuit for opening either one of said first and second gates at a time.

2. A video file apparatus according to claim **1**, wherein said video-signal storage device comprises a

magnetic recording medium, onto which outputs of said first and second gates are recorded.

3. A video file apparatus according to claim 1, wherein said control means includes timing means for generating timing signals representing predetermined periods of time designating positions at which said video signal from said video-signal generating source is to be displayed on said display device, said timing means counting the periods of time every time the synchronizing signals are received, whereby said first and second gates are controlled in dependence upon said periods of time so that one or the other of said first and second gates are opened at a time.

4. A video file apparatus comprising a synchronizing-signal generator circuit including a horizontal synchronizing-signal generator circuit and a vertical synchronizing-signal generator circuit, a display device operated in synchronism with synchronizing signals from said synchronizing-signal generator circuit, a recycling type of video-signal storage device synchronized with said synchronizing signals from said synchronizing-signal generator circuit, a video-signal generating source synchronized with said synchronizing signals from said synchronizing-signal generator circuit, first gate means for supplying a video signal from said video-signal storage device to said display device and back to said video-signal storage device, second gate means for supplying a video signal from said video-signal generating source to said display device and said video-signal storage device, first and second one-shot multivibrators responsive to a horizontal synchronizing signal from said horizontal synchronizing-signal generator circuit, a first flip-flop which is set by an output of said first one-shot multivibrator and which is reset by an output of said second one-shot multi-vibrator, third and fourth one-shot multivibrators which are set by a vertical synchronizing signal from said vertical synchronizing-signal generator circuit, a second flip-flop which is set by an output of said third one-shot multivibrator and which is reset by an output of said fourth one-shot multivibrator, an AND gate having respective inputs connected to the set outputs of said first and second flop-flops, means for opening said first gate means in response to an output of said AND gate, and means for opening said second gate means in response to an inverted output of said AND gate.

* * * * *

UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,728,712 Dated April 17, 1973

Inventor(s) Hiroshi Nagai

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

First page of patent, priority data omitted. Should read:

--Application No. 45/376, Japan, January 5, 1970--

Signed and sealed this 1st day of January 1974.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

RENE D. TEGTMEYER
Acting Commissioner of Patents

FORM PO-1050 (10-69)

USCOMM-DC 60376-P69
☆ U.S. GOVERNMENT PRINTING OFFICE : 1969 O—366-334