

Description

This invention relates to television receivers.

A so-called picture-in-picture television receiver, in which a sub-picture screen is inset into a main picture screen in a picture-in-picture fashion, has been previously proposed. Japanese Patent Application Publication JP-A-56-27573 discloses a picture-in-picture television receiver in which a plurality of still pictures taken at different times from a sub-picture on a main picture screen can be inset into the main picture screen in a picture-in-picture fashion.

According to the present invention there is provided a television receiver comprising:

- (a) a cathode ray tube having a picture screen which is divisible into a main picture screen and one or more sub-picture screens inset into the main picture screen;
- (b) a main picture circuit for supplying a first video signal for the main picture screen;
- (c) a video signal processor circuit having a memory and including means for selecting one video signal from among said first video signal and a second video signal, and for forming from the selected signal a sub-picture video signal for one or more of the sub-picture screens;
- (d) a composing circuit connected to the video signal processor circuit and to the main picture circuit for composing the first video signal and the sub-picture video signal into a composite signal to be supplied to the cathode ray tube;
- (e) a system control circuit for controlling the main picture circuit, the video signal processor circuit and the composing circuit; and
- (f) a step-by-step picture switch connected to the system control circuit for supplying a step-by-step picture command signal to the system control circuit characterised in that

when the step-by-step picture switch is operated, the system control circuit detects whether a sub-picture screen is inset into the main picture screen or not, and if only the first video signal is supplied to the composing circuit, the system control circuit is operative to cause said first video signal to be supplied to the video signal processor circuit to form a plurality of still picture signals taken at different times from said first video signal, and said first video signal and the plurality of still picture signals taken from said first video signal are supplied to the composing circuit, but if, when the step-by-step picture switch is operated, the composing circuit is supplied with said first video signal and a sub-picture video signal corresponding to said second video signal, the system control circuit is operative to cause said second video signal to be supplied to the video signal processor circuit to form a plurality of still picture signals taken at

different times from said second video signal, said first video signal and a sub-picture signal corresponding to the plurality of still picture signals taken from said second video signal are supplied to the composing circuit and the video signal processor circuit is operative to cause pictures corresponding to the plurality of still picture signals taken at different times from said second video signal to be reproduced on a plurality of sub-picture screens with locations that are different from a plurality of sub-picture screens reproducing the plurality of still pictures taken at different times from said first video signal.

In such a television receiver, according to the presence or absence of the sub-picture, both the main picture and sub-still pictures can be easily reproduced in a step-by-step fashion by operating the step-by-step picture switch.

The invention will now be further described, by way of illustrative and non-limiting example, with reference to the accompanying drawings, in which like references designate like elements and parts throughout, and in which:

Figure 1 is a block diagram of a television receiver in accordance with a preferred embodiment of the present invention;

Figure 2 is a flow chart to which reference is made in explaining the function of the television receiver shown in Figure 1; and

Figures 3A to 3D are schematic representations used to explain the pictures displayed by the television receiver shown in Figure 1.

Figure 1 is a block diagram showing an overall circuit arrangement of a television receiver embodying the present invention. The television receiver includes a main television circuit MK and a sub-television circuit SK. A video signal supplied by the main television circuit MK causes a main picture to be displayed on the whole of a picture screen of a cathode ray tube 18, whereas a video signal supplied by the sub-television circuit SK causes a sub-picture to be displayed on a portion of the main picture screen in such a manner that the sub-picture is inset into the main picture. The main and sub-television circuits MK and SK include main and sub-tuners 5M, 5S, main and sub-video intermediate frequency circuits 6M, 6S and main and sub-video/chrome signal circuits 8M, 8S, respectively.

The television receiver is provided with external video signal input terminals V1, V2 and V3 to which reproduced video signals (base band signals) from a video tape recorder (VTR) or the like can be supplied. Selection of the video signals from the external input terminals V1, V2 and V3, in place of the video signals from the tuners 5M and 5S, can be effected by main and sub-switching circuits 7M and 7S provided in the television circuits MK and

SK. The signal selected by the switching circuit 7M is then supplied to the cathode ray tube 18 to be displayed on its picture screen.

The sub-television circuit SK includes a video signal processor circuit 12 for displaying the sub-picture on the picture screen of the cathode ray tube 18. The video signal processor circuit 12 controls the kinds of sub-picture or sub-pictures (such as a live picture, a still picture, a step-by-step picture or the like), the number of sub-pictures, the position of the sub-picture on the main picture screen, and so forth. The expression "live picture" means that the displayed image is animated (moving) rather than static (still).

The main and sub-television circuits MK and SK are provided with respective main and sub-character display circuits 19M and 19S to display picture discriminating indications 32M, 52S, respectively, on the main picture screen and the sub-picture screen, respectively, in an inset fashion as shown in Figure 3C. Each indication 32M, 52S may, for example, comprise the channel identification (for instance the channel number) of a received television broadcast or the number of an external video signal input terminal.

The television receiver includes a system control circuit or controller 20 which includes a micro-computer. Respective sections of the television receiver are controlled by the system control circuit 20 as will be explained in greater detail hereinafter.

The circuit arrangement of the television receiver will now be described more fully. A television broadcast signal received by an aerial (antenna) AT is supplied to a distributor 1. The distributor 1 supplies the received signal through a switching circuit 3 to the main tuner 5M, without substantially attenuating the signal, and also supplies a portion of the received signal to the sub-tuner 5S. The received signal portion is amplified by a high frequency amplifier 4 before it is applied to the sub-tuner 5S. The switching circuit 3 selectively switches between the aerial input signal from the distributor 1, and a high frequency input signal from a descrambler used for receiving a cable television broadcast or the like and supplied to an auxiliary input terminal 2, and supplies one of the signals to the main tuner 5M.

The video signal from the main tuner 5M is supplied to the main video intermediate frequency circuit 6M and a video intermediate frequency signal is supplied therefrom to the main switching circuit 7M which can be selectively switched between this video signal and the external video signals from the external video input terminals V1 to V3. The signal selected by the switching circuit 7M is supplied to the main video/chroma signal circuit 8M. A monitor output terminal 26 is connected to the output side of the main switching

circuit 7M. The video/chroma signal circuit 8M generates red, green and blue colour signals R, G and B which are fed to a switching circuit 9.

An audio intermediate frequency signal from the main video intermediate frequency circuit 6M is supplied to an audio circuit (incorporating a sound multiplexing decoder circuit) 28. An audio signal from the audio circuit 28 is supplied to a switching circuit 29 which can be selectively switched between this audio signal and external audio signals reproduced from a VTR or the like and supplied thereto from external audio signal input terminals A1, A2 and A3, respectively, corresponding to the external video signal input terminals V1, V2 and V3. The audio signal selected by the switching circuit 29 is supplied through a low frequency amplifier 30 to a loudspeaker 31.

Horizontal and vertical synchronising signals from the main video/chroma signal circuit 8M are supplied to a deflection/high voltage circuit 27. A deflection signal and a high dc voltage from the circuit 27 are supplied to the cathode ray tube 18.

The video signal from the sub-tuner 5S is supplied to the sub-video intermediate frequency circuit 6S and a video intermediate frequency signal is supplied therefrom to the sub-switching circuit 7S which selectively switches between this video signal and the external video signals from the external video signal input terminals V1 to V3. A switch 25 effects selection between video signals selected by the switching circuit 7S and the video signal from the main switching circuit 7M and supplies the chosen video signal to the sub-video/chroma signal circuit 8S. The sub-video/chroma signal circuit 8S generates red, green and blue colour signals R, G and B which are supplied to a matrix circuit 10 in which they are converted to a luminance signal Y and red and blue colour difference signals R-Y and B-Y, respectively, which are then fed to an analog-to-digital (A/D) converter 13 in the video signal processor circuit 12.

The A/D converter 13 is a time division type A/D converter as disclosed, for example, in Japanese Patent Application Publication No. 60-47792. A digital signal from the A/D converter 13 is supplied to a memory 14 and written therein. The digital signal is read out from the memory 14 and supplied to a digital-to-analog (D/A) converter 15 so as thereby to be converted to an analog signal. In the video signal processor circuit 12, sampling lines and picture elements of the video signal are selected and other lines and picture elements are thrown away or removed in correspondence with the ratio between the sizes of the main picture screen and the sub-picture screen. The memory 14 has frame (or field) memory areas corresponding to the maximum number of displayable sub-pictures,

for example four frame memory areas. The memory 14 is controlled by a sub-picture control circuit 16 so as to specify the kinds of sub-picture or sub-pictures (such as a live picture, a still picture, a step-by-step picture and so on), the number of sub-pictures, the position of the sub-picture on the main picture and the like.

When the sub-picture is made as a live picture, that is a real moving picture, the video signal is alternately written in and read out from the memory 14 continuously and repeatedly; when the sub-picture is made as a still picture, the video signal is written in the memory 14 for a selected frame or field period and then read out from the memory 14 repeatedly; and when the sub-picture is made as a step-by-step picture, a plurality of video signals are written in the memory 14 at different times corresponding to different frames or field periods and then read out therefrom repeatedly (see Japanese Patent Application Publication No. 56-27573). The number of the sub-picture screens inset into, within or on the main picture screen is determined on the basis of the number of memory areas in the memory 14 which are used. The contents or picture of the sub-picture screen can be a real moving picture, a still picture or a step-by-step picture based on the video signal from the sub-video/chroma signal circuit 8S or on the video signal from the main video/chroma signal circuit 8M. The switching of these video signals is carried out by the switch 25. The picture contents on the main picture screen and the sub-picture screen can be exchanged with each other by simultaneously switching the reception channels of the main and sub-tuners 5M and 5S or by simultaneously switching the main and sub-switching circuits 7M and 7S.

The respective colour signals from the main/video chroma signal circuit 8M and the respective colour signals from the D/A converter 15 are supplied to the switching circuit 9 in which both groups of respective colour signals are switched at appropriate timing intervals such that the sub-picture screen is inset into one portion of the main picture screen at a selected, predetermined position. The switching circuit 9 is controlled by the sub-picture control circuit 16, which is controlled by the system control circuit 20. The video signal from the switching circuit 9 is supplied to the cathode ray tube 18.

The main picture discrimination indicating signal, such as a signal indicative of the main channel number, is formed by the main character display circuit 19M and is added to the video signal by an adder 17 connected between the switching circuit 9 and the cathode ray tube 18. In this example, the adder 17 is interposed only in the transmission path of the green colour signal G to thereby superimpose a green picture discrimination indication

upon the main picture screen. It is of course possible for this picture discrimination indication to be made by using other colours.

The sub-picture discrimination indicating signal, which is formed by the sub-character display circuit 19S and which could be indicative of the channel number selected by the sub-tuner 5S, for example, is added to the sub-video signal by an adder 11 connected between the matrix circuit 10 and the A/D converter 13. In this example, the adder 11 is interposed only in the transmission path of the luminance signal Y to thereby superimpose a white picture discrimination indication on the sub-picture screen. However, it is possible for this picture discrimination indication to be made by using other colours.

Channel selections in the main tuner 5M and sub-tuner 5S are carried out by channel selection signals from the system control circuit 20. The switching circuits 3, 7M, 7S, 29 and the switch 25 are also selectively switched under the control of the system control circuit 20. The main and sub-video/chroma signal circuits 8M and 8S are subjected to blanking by the system control circuit 20 for a short period upon up and down scanning channel selection operation. Alternatively, such blanking may be carried out by a blanking switch that is provided at a stage before the cathode ray tube 18. Further, main and sub-horizontal synchronising signals Hm and Hs from the main and sub-video intermediate frequency circuits 6M and 6S and main and sub-vertical blanking signals (vertical signals) Vm and Vs from the main and sub-video/chroma signal circuits 8M and 8S are supplied to the system control circuit 20. The main picture and sub-picture discrimination indicating signal circuits 19M and 19S and the sub-picture control circuit 16 are controlled by the system control circuit 20.

A last-condition memory 21 stores, under the control of the system control circuit 20, the selected channels of the main and sub-tuners 5M and 5S, the switch conditions of the switching circuits 7M and 7S, the control conditions of the sub-picture control circuit 16 and so on when power to the television receiver is turned off. When the television receiver is turned on again, the conditions of the respective circuits present when the television receiver was last turned off are reproduced under the control of the system control circuit 20.

A key apparatus 22 is connected to the system control circuit 20 and is provided with various kinds of keys KY to control the television receiver.

A remote controller (commander) 24 also is provided with various kinds of keys KY to control the television receiver. The remote controller 24 is also provided with a transmitter (not shown) to transmit a remote control signal based on the cor-

responding key operation. A receiver 23 for receiving the signal transmitted from the transmitter of the remote controller 24 is connected to the system control circuit 20. The remote control signal can be transmitted by means of a light beam, radio wave, sound wave and so on.

By way of example, the keys KY of the key apparatus 22 or the remote controller 24 may comprise: a power key; a recall key (used to display the picture discrimination indication such as the channel number); a mute key (used to mute the sound); ten keys used to select the reception channel and the number of the external video signal input terminal; a TV (television)/VTR change-over key; an aerial input/auxiliary high frequency input changeover key; a sound multiplexing key; up and down keys for incrementing and decrementing the contrast of luminance and chrominance signals, the main reception channels, the number of the main external video signal input terminal, and the sound volume, respectively; an on-off key for the sub-picture screen; up and down keys for incrementing and decrementing the sub-reception channel and the number of the sub-external video signal input terminal; a still picture key 35; a step-by-step picture key 36; a shift key 37 used to shift the position of the sub-picture screen; and a main-sub-exchange key 38 used to exchange the picture contents on the main picture and sub-picture screens.

The function of the system control circuit 20 in reproducing the picture in a step-by-step manner will now be described with reference to a flow chart shown in Figure 2 and explanatory diagrams shown in Figures 3A to 3D.

Referring to the flow chart of Figure 2, a routine followed by the system control circuit 20 for reproducing the picture in a step-by-step fashion begins with a step ST-0. For example, when the step-by-step picture key 36 of the remote controller 24 (Figure 1) is depressed by the viewer to operate a step-by-step picture switch, the fact that the step-by-step switch is operated is detected at a step ST-1 and the program then goes to a step ST-2. At the step ST-2, the system control circuit 20 determines whether or not the sub-picture screen is displayed.

When only the video signal from the main video/chroma signal circuit 8M is supplied to the switching circuit 9 shown in Figure 1, only a main picture screen (real moving picture) M - and not the sub-picture - is displayed on the picture screen of the cathode ray tube 18, as shown in Figure 3A. At that time, at a step ST-5, a command for reproducing a picture displayed on the main picture screen M in a step-by-step picture fashion is issued from the system control circuit 20, causing the video signal from the main switching circuit 7M to be selected by the switch 25 and supplied to the

sub-video/chroma signal circuit 8S. The R, G, B video signal output from the sub-video/chroma signal circuit 8S is supplied to the video signal processor circuit 12 which forms three still picture signals taken at different times. The three still picture signals and the video signal from the main video/chroma signal circuit 8M are supplied to the switching circuit 9 and are composed therein. The thus-composed video signal is supplied to the cathode ray tube 18. Accordingly, as shown in Figure 3B, a step-by-step picture composed of sub-picture screens S_1 , S_2 and S_3 of the three still pictures taken at different times from the main picture video signal is displayed on, for example, the left-hand side of the main picture screen (real moving picture) M in the vertical direction in a picture-in-picture fashion (at a step ST-6).

However, when the switching circuit 9 is being supplied with the video signal from the main video/chroma signal circuit 8M and a live, sub-picture screen video signal from the video signal processor circuit 12, the main picture screen (real moving picture) M and the sub-picture screen (real moving picture) S_1 are displayed on the picture screen of the cathode ray tube 18 as shown in Figure 3C. If, at that time, at a step ST-3, a command for reproducing the picture on the sub-picture screen in the step-by-step manner is issued from the system control circuit 20, the video signal from the sub-switching circuit 7S is selected by the switch 25 and is supplied to the sub-video/chroma signal circuit 8S. Then, the video signal output from the sub-video/chroma signal circuit 8S is supplied to the video signal processor circuit 12 which generates a video signal (real moving picture signal) for the sub-picture screen and three still picture signals taken at different times from the real, moving, sub-picture video signal. Thereafter, this video signal (real moving picture signal) for the sub-picture screen, the three still picture signals and the video signal from the main video/chroma signal circuit 8M are supplied to the switching circuit 9 and are composed therein. The thus-composed signal is then supplied to the cathode ray tube 18. Accordingly, the sub-picture screen S_1 (real moving picture) shown in Figure 3C and three step-by-step still pictures S_2 , S_3 , and S_4 taken at different times from the real, moving sub-picture screen are displayed in a picture-in-picture fashion (at a step ST 4) at, for example, four corners of the main picture screen (real moving picture) M, as shown in Figure 3D. It is possible to shift the place on the main screen where the real, moving sub-picture screen is located among the four sub-picture screens S_1 to S_4 , taken in this order.

If, at a step ST-7 it is determined that the step-by-step picture key 36 of the remote controller 24 is depressed again to operate the step-by-step

switch, the program goes back to the step ST-2 in which another step-by-step reproduction operation can again be carried out at other, different times. At step ST-8, if it is determined that the on-off switch for turning on and off the sub-picture screen is operated by depressing the on-off key of the remote controller 24 for the sub-picture, the displayed state of the video screen of the cathode ray tube 18 is returned to the main picture screen (real moving picture) M shown in Figure 3A and, therefore, the step-by-step reproduction is ended.

Furthermore, since the locations of the plurality of sub-picture screens in the step-by-step reproducing mode are made different, as shown in Figures 3B and 3D, as between the step-by-step reproduction of the picture of the main picture screen and the step-by-step reproduction of the picture of the sub-picture screen, the step-by-step reproduction of the main picture screen and the step-by-step reproduction of the sub-picture screen can easily be visually discriminated from each other.

According to embodiment of the present invention as set forth above, it becomes possible to have a television receiver in which, in accordance with the presence or absence of the sub-picture screen, the pictures of both the main picture and sub-picture screens can be easily reproduced in a step-by-step fashion by operating the step-by-step picture switch.

Claims

1. A television receiver comprising:

(a) a cathode ray tube (18) having a picture screen which is divisible into a main picture screen (M) and one or more sub-picture screens (S_1 , S_2 , S_3 , S_4) inset into the main picture screen (M);

(b) a main picture circuit (MK) for supplying a first video signal for the main picture screen;

(c) a video signal processor circuit (12) having a memory (14) and including means (25) for selecting one video signal from among said first video signal and a second video signal, and for forming from the selected signal a sub-picture video signal for one or more of the sub-picture screens (S_1 , S_2 , S_3 , S_4);

(d) a composing circuit (9) connected to the video signal processor circuit (12) and to the main picture circuit (MK) for composing the first video signal and the sub-picture video signal into a composite signal to be supplied to the cathode ray tube (18);

(e) a system control circuit (20) for controlling the main picture circuit (MK), the video signal processor circuit (12) and the com-

posing circuit (9); and

(f) a step-by-step picture switch (36), connected to the system control circuit (20), for supplying a step-by-step picture command signal to the system control circuit (20), characterised in that

when the step-by-step picture switch (36) is operated, the system control circuit (20) detects whether a sub-picture screen (S_1) is inset into the main picture screen (M) or not, and if only the first video signal is supplied to the composing circuit (9), the system control circuit (20) is operative to cause said first video signal to be supplied to the video signal processor circuit (12) to form a plurality of still picture signals taken at different times from said first video signal, and said first video signal and the plurality of still picture signals taken from said first video signal are supplied to the composing circuit (9), but if, when the step-by-step picture switch (36) is operated, the composing circuit (9) is supplied with said first video signal and a sub-picture video signal corresponding to said second video signal, the system control circuit (20) is operative to cause said second video signal to be supplied to the video signal processor circuit (12) to form a plurality of still picture signals taken at different times from said second video signal, said first video signal and a sub-picture signal corresponding to the plurality of still picture signals taken from said second video signal are supplied to the composing circuit (9), and the video signal processor circuit (12) is operative to cause pictures corresponding to the plurality of still picture signals taken at different times from said second video signal to be reproduced on a plurality of sub-picture screens (S_1 , S_2 , S_3) with locations that are different from a plurality of sub-picture screens reproducing the plurality of still pictures taken at different times from said first video signal.

2. A television receiver according to claim 1, wherein the number of said sub-picture screens (S_1 , S_2 , S_3) formed from said first video signal is three.

3. A television receiver according to claim 2, wherein said three sub-picture screens (S_1 , S_2 , S_3) are located in the vertical direction near one side of the main picture screen (M).

4. A television receiver according to claim 1, wherein the number of said sub-picture screens (S_1 , S_2 , S_3) formed from said second video signal on which still pictures are displayed is three.



switch, the program goes back to the step ST-2 in which another step-by-step reproduction operation can again be carried out at other, different times. At step ST-8, if it is determined that the on-off switch for turning on and off the sub-picture screen is operated by depressing the on-off key of the remote controller 24 for the sub-picture, the displayed state of the video screen of the cathode ray tube 18 is returned to the main picture screen (real moving picture) M shown in Figure 3A and, therefore, the step-by-step reproduction is ended.

Furthermore, since the locations of the plurality of sub-picture screens in the step-by-step reproducing mode are made different, as shown in Figures 3B and 3D, as between the step-by-step reproduction of the picture of the main picture screen and the step-by-step reproduction of the picture of the sub-picture screen, the step-by-step reproduction of the main picture screen and the step-by-step reproduction of the sub-picture screen can easily be visually discriminated from each other.

According to embodiment of the present invention as set forth above, it becomes possible to have a television receiver in which, in accordance with the presence or absence of the sub-picture screen, the pictures of both the main picture and sub-picture screens can be easily reproduced in a step-by-step fashion by operating the step-by-step picture switch.

Claims

1. A television receiver comprising:

(a) a cathode ray tube (18) having a picture screen which is divisible into a main picture screen (M) and one or more sub-picture screens (S_1, S_2, S_3, S_4) inset into the main picture screen (M);

(b) a main picture circuit (MK) for supplying a first video signal for the main picture screen;

(c) a video signal processor circuit (12) having a memory (14) and including means (25) for selecting one video signal from among said first video signal and a second video signal, and for forming from the selected signal a sub-picture video signal for one or more of the sub-picture screens (S_1, S_2, S_3, S_4);

(d) a composing circuit (9) connected to the video signal processor circuit (12) and to the main picture circuit (MK) for composing the first video signal and the sub-picture video signal into a composite signal to be supplied to the cathode ray tube (18);

(e) a system control circuit (20) for controlling the main picture circuit (MK), the video signal processor circuit (12) and the com-

posing circuit (9); and

(f) a step-by-step picture switch (36), connected to the system control circuit (20), for supplying a step-by-step picture command signal to the system control circuit (20), characterised in that

when the step-by-step picture switch (36) is operated, the system control circuit (20) detects whether a sub-picture screen (S_1) is inset into the main picture screen (M) or not, and if only the first video signal is supplied to the composing circuit (9), the system control circuit (20) is operative to cause said first video signal to be supplied to the video signal processor circuit (12) to form a plurality of still picture signals taken at different times from said first video signal, and said first video signal and the plurality of still picture signals taken from said first video signal are supplied to the composing circuit (9), but if, when the step-by-step picture switch (36) is operated, the composing circuit (9) is supplied with said first video signal and a sub-picture video signal corresponding to said second video signal, the system control circuit (20) is operative to cause said second video signal to be supplied to the video signal processor circuit (12) to form a plurality of still picture signals taken at different times from said second video signal, said first video signal and a sub-picture signal corresponding to the plurality of still picture signals taken from said second video signal are supplied to the composing circuit (9), and the video signal processor circuit (12) is operative to cause pictures corresponding to the plurality of still picture signals taken at different times from said second video signal to be reproduced on a plurality of sub-picture screens (S_1, S_2, S_3) with locations that are different from a plurality of sub-picture screens reproducing the plurality of still pictures taken at different times from said first video signal.

2. A television receiver according to claim 1, wherein the number of said sub-picture screens (S_1, S_2, S_3) formed from said first video signal is three.

3. A television receiver according to claim 2, wherein said three sub-picture screens (S_1, S_2, S_3) are located in the vertical direction near one side of the main picture screen (M).

4. A television receiver according to claim 1, wherein the number of said sub-picture screens (S_1, S_2, S_3) formed from said second video signal on which still pictures are displayed is three.



5. A television receiver according to claim 4, wherein the three sub-picture screens (S_1 , S_2 , S_3) are located at three corners of the main picture screen (M).

6. A television receiver according to claim 1, wherein the number of sub-picture screens (S_1 , S_2 , S_3 , S_4) formed from said second video signal is four and a picture on one (S_1) of the four sub-picture screens is arranged to be a live picture signal.

Patentansprüche

1. Fernsehempfänger, der umfaßt:

- (a) eine Katodenstrahlröhre (18), die einen Bildschirm hat, der in einen Hauptbildschirm (M) und einen oder mehrere Unterbildschirme (S_1 , S_2 , S_3 , S_4), die in den Hauptbildschirm (M) eingefügt werden, unterteilbar ist,
 - (b) eine Hauptbildschaltung (MK) zum Liefern eines ersten Videosignals für den Hauptbildschirm,
 - (c) eine Videosignal-Verarbeitungsschaltung (12), die einen Speicher (14) hat und ein Mittel (25) zum Auswählen eines Videosignals aus dem ersten Videosignal und einem zweiten Videosignal und zum Bilden eines Unterbild-Videosignals für einen oder mehrere der Unterbildschirme (S_1 , S_2 , S_3 , S_4) aus dem ausgewählten Signal enthält,
 - (d) eine Zusammensetzungsschaltung (9), die mit der Videosignal-Verarbeitungsschaltung (12) und der Hauptbildschaltung (MK) zum Zusammensetzen des ersten Videosignals und des Unterbild-Videosignals zu einem zusammengesetzten Signal, das der Katodenstrahlröhre (18) zuzuführen ist, verbunden ist,
 - (e) eine Systemsteuerschaltung (20) zum Steuern der Hauptbildschaltung (MK), der Videosignal-Verarbeitungsschaltung (12) und der Zusammensetzungsschaltung (9) und
 - (f) einen Schritt-für-Schritt-Bildschalter (36), der mit der Systemsteuerschaltung (20) verbunden ist, zum Liefern eines Schritt-für-Schritt-Bildbefehlssignals an die Systemsteuerschaltung (20),
- dadurch gekennzeichnet, daß,
- wenn der Schritt-für-Schritt-Bildschalter (36) betätigt wird, die Systemsteuerschaltung (20) erfaßt, ob ein Unterbildschirm (S_1) in den Hauptbildschirm (M) eingefügt oder nicht eingefügt ist, und falls der Zusammensetzungsschaltung (9) nur das erste Videosignal zugeführt wird, die Systemsteuerschaltung (20) be-

treibbar ist, um zu veranlassen, daß der Videosignal-Verarbeitungsschaltung (12) das erste Videosignal zugeführt wird, um eine Vielzahl von Stehbildsignalen zu bilden, die dem ersten Videosignal zu unterschiedlichen Zeiten entnommen werden, und der Zusammensetzungsschaltung (9) das erste Videosignal und die Vielzahl von Stehbildsignalen, die dem ersten Videosignal entnommen sind, zugeführt werden, jedoch falls, wenn der Schritt-für-Schritt-Bildschalter (36) betätigt wird, die Zusammensetzungsschaltung (9) mit dem ersten Videosignal und einem Unterbild-Videosignal, das dem zweiten Videosignal entspricht, beliefert wird, die Systemsteuerschaltung (20) betreibbar ist, um zu veranlassen, daß der Videosignal-Verarbeitungsschaltung (12) das zweite Videosignal zugeführt wird, um eine Vielzahl von Stehbildsignalen zu bilden, die dem zweiten Videosignal zu unterschiedlichen Zeiten entnommen werden, der Zusammensetzungsschaltung (9) das erste Videosignal und ein Unterbildsignal, das der Vielzahl von Stehbildsignalen entspricht, die dem zweiten Videosignal entnommen sind, zugeführt werden und die Videosignal-Verarbeitungsschaltung (12) betreibbar ist, um zu veranlassen, daß Bilder, die der Vielzahl von Stehbildsignalen entsprechen, die dem zweiten Videosignal zu unterschiedlichen Zeiten entnommen sind, auf einer Vielzahl von Unterbildschirmen (S_1 , S_2 , S_3) mit Orten wiedergegeben werden, die unterschiedlich von der Vielzahl von Unterbildschirmen sind, die die Vielzahl von Stehbildern, welche dem ersten Videosignal zu unterschiedlichen Zeiten entnommen sind, wiedergeben.

- 2. Fernsehempfänger nach Anspruch 1, bei dem die Anzahl der Unterbildschirme (S_1 , S_2 , S_3) drei beträgt.
- 3. Fernsehempfänger nach Anspruch 2, bei dem die drei Unterbildschirme (S_1 , S_2 , S_3) in der vertikalen Richtung nahe einer Seite des Hauptbildschirms (M) angeordnet sind.
- 4. Fernsehempfänger nach Anspruch 1, bei dem die Anzahl der aus dem zweiten Videosignal gebildeten Unterbildschirme (S_1 , S_2 , S_3), auf welchen Stehbilder angezeigt werden, drei beträgt.
- 5. Fernsehempfänger nach Anspruch 4, bei dem die drei Unterbildschirme (S_1 , S_2 , S_3) bei drei Ecken des Hauptbildschirms angeordnet sind.
- 6. Fernsehempfänger nach Anspruch 1, bei dem die Anzahl von Unterbildschirmen (S_1 , S_2 , S_3 ,



S₄), die aus dem zweiten Videosignal gebildet werden, vier beträgt und ein Bild auf einem (S₁) der vier Unterbildschirme so beschaffen ist, daß es einem Bewegungsbildsignal entspricht.

Revendications

1. Récepteur de télévision comprenant :

(a) un tube à rayons cathodiques (18) comportant un écran d'image qui peut être divisé en un écran d'image principale (M) et un ou plusieurs écrans d'image secondaire (S₁, S₂, S₃, S₄) incrustés dans l'écran d'image principale (M) ;

(b) un circuit d'image principale (MK) pour délivrer un premier signal vidéo pour l'écran d'image principale ;

(c) un circuit processeur de signal vidéo (12) comportant une mémoire (14) et possédant des moyens (25) pour sélectionner un signal vidéo entre ledit premier signal vidéo et un second signal vidéo, et pour former à partir du signal sélectionné un signal vidéo d'image secondaire pour un ou plusieurs écrans d'image secondaire (S₁, S₂, S₃, S₄) ;

(d) un circuit de composition (9) connecté au circuit processeur de signal vidéo (12) et au circuit d'image principale (MK) pour composer le premier signal vidéo et le signal vidéo d'image secondaire en un signal composite à délivrer au tube à rayon cathodiques (18) ;

(e) un circuit de commande de système (20) pour commander le circuit d'image principale (MK), le circuit processeur de signal vidéo (12) et le circuit de composition (9) ; et

(f) un commutateur d'image pas-à-pas (36), connecté au circuit de commande de système (20), pour délivrer un signal de commande d'image pas-à-pas au circuit de commande de système (20), caractérisé en ce que :

lorsque le commutateur d'image pas-à-pas (36) est manoeuvré, le circuit de commande de système (20) détecte si un écran d'image secondaire (S₁) est incrusté ou non dans l'écran d'image principale (M), et si seul le premier signal vidéo est délivré au circuit de composition (9), le circuit de commande de système (20) sert à faire que ledit premier signal vidéo soit délivré au circuit processeur de signal (12) pour former une pluralité de signaux d'image fixe pris à des instants différents à partir dudit premier signal vidéo, et que ledit premier signal vidéo et la pluralité de signaux d'image fixe pris à partir dudit premier signal vidéo soient délivrés au circuit de com-

position (9), mais si, lorsque le commutateur d'image pas-à-pas (36) est manoeuvré, le circuit de composition (9) est alimenté avec ledit premier signal vidéo et un signal vidéo d'image secondaire correspondant audit second signal vidéo, le circuit de commande du système (20) sert à faire que le second signal vidéo soit délivré au circuit processeur de signal vidéo (12) pour former une pluralité de signaux d'image fixe pris à des instants différents à partir dudit second signal vidéo, que ledit premier signal vidéo et un signal d'image secondaire correspondant à la pluralité des signaux d'image fixe pris à partir dudit second signal vidéo sont délivrés au circuit de composition (9) et le circuit processeur de signal vidéo (12) sert à faire que des images correspondant à l'ensemble des signaux d'image fixe pris à des instants différents à partir dudit second signal vidéo soit reproduites sur une pluralité d'écrans d'image secondaire (S₁, S₂, S₃) dont les emplacements sont différents de ceux de la pluralité des écrans d'image secondaire reproduisant la pluralité des images fixes prises à des instants différents à partir dudit premier signal vidéo.

2. Récepteur de télévision selon la revendication 1, dans lequel le nombre desdits écrans d'image secondaire (S₁, S₂, S₃) formés à partir dudit premier signal vidéo est trois.

3. Récepteur de télévision selon la revendication 2, dans lequel lesdits trois écrans d'image secondaire (S₁, S₂, S₃) sont situés dans la direction verticale près de l'un des côtés de l'écran d'image principale (M).

4. Récepteur de télévision selon la revendication 1, dans lequel le nombre desdits écrans d'image secondaire (S₁, S₂, S₃) formés à partir dudit second signal vidéo sur lequel des images fixes sont affichées est trois.

5. Récepteur de télévision selon la revendication 4, dans lequel lesdits trois écrans d'image secondaire (S₁, S₂, S₃) sont situés au droit de trois coins de l'écran d'image principale (M).

6. Récepteur de télévision selon la revendication 1, dans lequel le nombre d'écrans d'image secondaire (S₁, S₂, S₃, S₄) formés à partir dudit second signal vidéo est quatre et dans lequel une image sur l'un (S₁) des quatres écrans d'image secondaire est disposée de manière à être un signal d'image animée.