

Description

The present invention relates to a video processing apparatus for creating a wipe effect in which a sequence of output frames is created from two input frame sequences such that a decreasing proportion of successive frames in the output sequence is derived from a first one of said input sequences and an increasing proportion of said successive frames in said output sequence is derived from a second one of said input sequences.

The video effect known as a "wipe" consists of gradually removing a first image to reveal a second image; as if the first image were being rubbed off, or wiped from, the first image. Analogue systems for producing wipes are well known, for example, as shown in United States Patent No. US-A-3,371,160. The advent of operational amplifiers allowed analogue wipe techniques to be improved, for example, as shown in the articles by Michael Cox published under the title "Electronic Effects" in the June 1982 edition of the British Kinematography Sound and Television Society Journal. Cox described a system in which two video input signals (A and B) are combined by a control voltage C produced by a pattern generator. The instantaneous output is given by $AC + B(1-C)$ where C has a value between 0 and 1. The formation of the control signal is shown in which a sawtooth waveform is generated having a rise time equal to the duration of one TV line period. Manual potentiometers (referred to as faders) are then provided to adjust the position and size of a window over which C changes from 0 to 1. Similar means are then provided to generate a ramp equal to the frame period thus allowing wipes to be controlled in both the horizontal and vertical directions.

The disclosure states that it is possible to generate almost any imaginable pattern, using mixtures of analogue and digital circuit techniques. It will therefore be appreciated that such generation would not be performed by an unskilled operator but by a skilled electronic engineer. Thus the techniques could be employed when designing a machine but, once built, the operator would be presented with a collection of preset wipe shapes with no facility for creating new shapes.

The invention aims to provide an improved system for wiping between video images by providing a versatile system in which an operator may define the wipe shape. The invention also aims to provide a system for receiving two digitally encoded video signals to produce an output signal which wipes between the input signals.

According to the invention there is provided a video processing apparatus for creating a wipe effect in which each frame of an output video sequence is created from respective frames of two input video sequences (A,B) such that a portion of each frame of

each input sequence occupies a respective portion of the corresponding output frame with the size of the portion of the frames of one input sequence increasing and the size of the portion of the frames of the other input sequence correspondingly decreasing with time, the frames in each video sequence each comprising a plurality of picture elements,

the apparatus being characterised by a store (14) for storing a control image frame representing the shape of each of said image portions and comprising a plurality of control image elements; and a processor (17) comprising an adjustable counter (41) for providing a time-variable count, a comparator (42) for comparing the count with the value of control image elements to derive a control value for each picture element in the output video sequence which value represents the contribution to be made to each pixel in each output frame by respective pixels in each of said input frames, and a combiner (44-47) responsive to said control value for producing output pixels from respective pixels in each of said input frames.

Preferably the multi-bit signals are created by a video graphics system such as, for example, the system disclosed in United States Patent No. 4,602,286 (equivalent to United Kingdom Patent 2 113 950). As disclosed therein, a control image is used to combine a first image with a second image to produce a composed image. The first and second images represent single frames and the composed image does not vary over time. The graphical techniques used for creating the control (or stencil) signal are also available for generating the wipe shape signal of the present invention. Thus, unlike previous systems, the operator may design a wipe shape by simply drawing luminance values using a stylus and touch tablet combination.

The above and further features of the invention are set forth with particularity in the appended claims and together with advantages thereof will become clearer from consideration of the following detailed description of an exemplary embodiment of the invention given with reference to the accompanying drawings.

In the drawings:

Figure 1 shows a video processing system including a keying processor for wiping between two video input signals;

Figure 2 details the keying processing unit shown in Figure 1; and

Figure 3 details an alternative processing unit.

Turning now to Figure 1 of the accompanying drawings, a video processing system shown therein is arranged to create a wipe between a first video signal A, received from a VTR 10, and a second video signal B received from VTR 11. Both video recorders 10, 11 are preferably digital machines generating video sig-

nals in component format and their outputs are suitably synchronised. Signals A and B are conventional moving images; and in the figure images from A are shown as blank white, reference 12, and images from B as diagonal lines, reference 13.

The system includes several framestores, three of which are shown references 14, 15, 16. Store 14 is arranged to receive a multi-bit (preferably 8 bit) wipe shape signal and an addressing circuit 17A, included in a keying processor 17, addresses the wipe shape store 14 in synchronism with the input video signals, for VTR's 10, 11, during frame periods. The keying processor 17 then processes values read from store 14 with an internally generated reference signal to determine, on a pixel by pixel basis, whether the output is to be derived from the first input A, the second input B or a combination of these inputs. The wipe is then effected by adjusting said reference signal by calculated increments between frame reading, i.e. during the blanking periods.

The resulting output may be viewed on a television type monitor 18, recorded on a third VTR or written to a real time disc 19. Disc based systems for real time video are also manufactured by the present Assignee and sold under the trade mark "HARRY" and described in United States Patent No. US-A-4,688,106, equivalent to British Patent No. GB-A-2 156 627.

In addition to showing the resulting output video image, monitor 18 may also be used to display the wipe shape. Furthermore, the monitor 18 may be used interactively as part of a video graphics system including a graphics processor 20, a touch tablet 21 and a stylus 22. A video graphics system of this type is disclosed in United States Patents No. 4,514,818 and No. 4,602,286 in which movement of a graphic implement, such as a brush, chalk or air brush, is simulated by moving the stylus 22 over the touch tablet 21. The stylus generates a signal indicating the pressure with which it is applied to the tablet which, in combination with its x, y position, is supplied to the graphics processor 20.

The generation of a wipe shape by means of the video graphics system is similar to creating a stencil signal, as described in United States Patent No. 4,602,286. In this example, the wipe-shape signals consist of 8 bits for each pixel of the image which may be displayed as colour intensity values on monitor 18. A wipe is illustrated in Figure 1 by images 23 to 28 which occurs over a time interval, defined by the operator, of say two seconds. The second image B is revealed from the left edge of the screen and a band, parallel to this edge, moves across to the right until image B occupies the whole of the screen. The band itself consists of an area in which signals from both images are combined thus giving a soft blend between the two images. When displayed on monitor 18, the wipe shape may be shown as being read at its

left edge blending to white at its right edge; graduations of this type may be produced automatically by the video graphics system. Shapes may also be modified by manual use of the stylus synthesising, say, the operation of an air brush. As shown in Figure 1, both the graphics processor 20 and the keying processor 17 have access to framestores 14 to 16. Alternatively separate framestores may be provided and data transferred between them over a fixed link or by means of a transportable medium such as a flexible disc.

The keying processor 17 is detailed in Figure 2 in which pixel values are read from framestore 14, in synchronism with the video input signals, to produce a keying signal k. The eight bit wipe shape signals from framestore 14 are supplied in a digital filter 40 arranged to produce ten bit wipe signals W by smoothing the 8 bit signals; all processing within the keying processor 17 is carried out using ten bits. A counter 41 generates a reference signal R which is subtracted from values generated by filter 40, by a subtractor 42, to produce a difference signal D in which all values having a value less than zero are set to zero. The results are then supplied to a multiplier 43 which receives a preset gain value G as its second input to produce the keying signal k. The keying signal has a value between zero and unity and all results above unity are set to unity. A subtractor 44 produces a value $1-k$, for each value of k, which is supplied to a multiplier 45 arranged to receive the first video input signal, from VTR10, as its second input. A multiplier 46 receives the second video input signal, from VTR11, and the keying values k as its second input. The outputs from multipliers 45 and 46 are then combined by a summation circuit 47.

The counter 41 is programmed in response to commands from an operator representing the duration of the wipe, and hence the number of intermediate frames required during a wipe sequence. The maximum number of intermediate frames is determined by the number of bits being compared in subtractor 42 which, in this example, is set at ten bits. Once the number of intermediate frames has been selected, which in turn controls the duration of the wipe, then counter 41 is programmed to count down in suitable steps. Thus the arithmetic processes (performed by subtractors 42 and 44, and multipliers 43, 45 and 46) operate at video rate for each pixel signal - i.e. operation is in real time.

The width of the band in which the two images are combined is adjustable by the operator and results in adjustment to the value of G to supplied to multiplier 43. The value of the gain G and the width of the band are inversely related and, in this example, have been set at a value of 10. The wipe sequence shown in Figure 1 lasts for 2 seconds therefore wiping from image A to image B requires 120 frames according to the American NTSC standard. At the start of the

sequence the reference value R is set to unity and during each blanking period it is reduced by 1/120 so that it is equal to zero by frame 120. The extent of the wipe is shown for frames 24, 48, 72 and 96 in Figure 1 in which R is equal to 0.8, 0.6, 0.4 and 0.2 respectively.

If the processing is followed for any particular frame, say frame 48, it will be seen that $R=0.6$ which is subtracted for all values of W. For all values of W less than 0.6 D is set to 0 and for values of W from 0.6 to 1 D has a value of 0 to 0.4. These values are multiplied by 10 to give a range 0 to 4 but all values above unity are set to unity. Thus for values of W between 0 and 0.6, $K=0$ and only image A is selected. For values of W between 0.7 and unity, $K=1$ and only image B is selected. However, if W is greater than 0.6 and less than 0.7, then K has an intermediate value and both images are combined in proportions determined by the value of K. For the next frame the value of R is reduced and the band of intermediate values moves to the right.

Additional effects may be introduced by modulating the reference signal produced by counter 41, for example the transition may appear to ripple.

A further embodiment of the invention is shown in Figure 3, wherein parts also shown in Figure 2 are given the same reference followed by a prime, which is arranged to generate a colour band at the interface of the two video images. The unit is arranged to generate two keying signals, K_A and K_B , in which K_A combines the first video signal A with a fixed colour signal C to form a composite signal and K_B combines the composite signal with the second video input signal B.

The output from multiplier 43', formerly the keying signal K, is supplied to an adder 51 to form a signal $K+\frac{1}{2}$. This is then multiplied by 2 in multiplier 52 after which the value one is subtracted from the output of the multiplier 52 in subtractor 53. However, for all values above unity the output from 53 is set to unity therefore the output from 53, which forms keying signal K_A , has a slope which is greater than that of K so that the maximum output, $K=1$, is reached sooner. A subtractor 54 forms $1-K_A$ which is supplied to a multiplier 55 receiving the video signal A as its second input. The colour signal C is supplied on a line 56 to a multiplier 57 which receives K_A as its second input. A summation circuit 58 combines the outputs from multipliers 55 and 57 to produce a composite signal on a line 59.

The signal K is also supplied to a subtractor 60 to produce $K-\frac{1}{2}$ which is multiplied by 2 in multiplier 61, with all values below zero being set to zero, to produce K_B . Key signal K_B is supplied to a subtractor 62 to produce $1-K_B$ and this is supplied to a multiplier 63 which also receives the composite signal from line 59. The product of the second video signal and K_B is formed in a multiplier 64 and the output from this multiplier and the output from multiplier 63 are combined

in a summation circuit 65.

The invention may also be used for partial wipes in which the wipe sequence is stopped at a predetermined position, held and then returned to the original video source signal.

Having thus described the present invention by reference to a preferred embodiment it is to be well understood that the embodiment in question is exemplary only and that modifications and variations such as will occur to those possessed of appropriate knowledge and skills may be made without departure from the scope of the invention as set forth in the appended claims.

Claims

1. A video processing apparatus for creating a wipe effect in which each frame of an output video sequence is created from respective frames of two input video sequences (A,B) such that a portion of each frame of each input sequence occupies a respective portion of the corresponding output frame with the size of the portion of the frames of one input sequence increasing and the size of the portion of the frames of the other input sequence correspondingly decreasing with time, the frames in each video sequence each comprising a plurality of picture elements,

the apparatus being characterised by a store (14) for storing a control image frame representing the shape of each of said image portions and comprising a plurality of control image elements; and a processor (17) comprising an adjustable counter (41) for providing a time-variable count, a comparator (42) for comparing the count with the value of control image elements to derive a control value (D) for each picture element in the output video sequence which value represents the contribution to be made to each pixel in each output frame by respective pixels in each of said input frames, and a combiner (44-47) responsive to said control value for producing output pixels from respective pixels in each of said input frames.

2. A video processing apparatus according to claim 1, characterised in that said control image frame in said store is generated by a video graphics system (20, 21, 22).
3. A video processing apparatus according to claim 2, characterised in that said video graphics system includes manually operable input means in the form of a stylus (21) and a touch tablet (22).
4. A video processing apparatus according to claim 1, characterised in that said control value (D) rep-



sequence the reference value R is set to unity and during each blanking period it is reduced by $1/120$ so that it is equal to zero by frame 120. The extent of the wipe is shown for frames 24, 48, 72 and 96 in Figure 1 in which R is equal to 0.8, 0.6, 0.4 and 0.2 respectively.

If the processing is followed for any particular frame, say frame 48, it will be seen that $R=0.6$ which is subtracted for all values of W . For all values of W less than 0.6 D is set to 0 and for values of W from 0.6 to 1 D has a value of 0 to 0.4. These values are multiplied by 10 to give a range 0 to 4 but all values above unity are set to unity. Thus for values of W between 0 and 0.6, $K=0$ and only image A is selected. For values of W between 0.7 and unity, $K=1$ and only image B is selected. However, if W is greater than 0.6 and less than 0.7, then K has an intermediate value and both images are combined in proportions determined by the value of K . For the next frame the value of R is reduced and the band of intermediate values moves to the right.

Additional effects may be introduced by modulating the reference signal produced by counter 41, for example the transition may appear to ripple.

A further embodiment of the invention is shown in Figure 3, wherein parts also shown in Figure 2 are given the same reference followed by a prime, which is arranged to generate a colour band at the interface of the two video images. The unit is arranged to generate two keying signals, K_A and K_B , in which K_A combines the first video signal A with a fixed colour signal C to form a composite signal and K_B combines the composite signal with the second video input signal B .

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in a summation circuit 65.

The invention may also be used for partial wipes in which the wipe sequence is stopped at a predetermined position, held and then returned to the original video source signal.

Having thus described the present invention by reference to a preferred embodiment it is to be well understood that the embodiment in question is exemplary only and that modifications and variations such as will occur to those possessed of appropriate knowledge and skills may be made without departure from the scope of the invention as set forth in the appended claims.

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1. A video processing apparatus for creating a wipe effect in which each frame of an output video sequence is created from respective frames of two input video sequences (A, B) such that a portion of each frame of each input sequence occupies a respective portion of the corresponding output frame with the size of the portion of the frames of one input sequence increasing and the size of the portion of the frames of the other input sequence correspondingly decreasing with time, the frames in each video sequence each comprising a plurality of picture elements, the apparatus being characterised by a store (14) for storing a control image frame representing the shape of each of said image portions and comprising a plurality of control image elements; and a processor (17) comprising an adjustable counter (41) for providing a time-variable count, a comparator (42) for comparing the count with the value of control image elements to derive a control value (D) for each picture element in the output video sequence which value represents the contribution to be made to each pixel in each output frame by respective pixels in each of said input frames, and a combiner (44-47) responsive to said control value for producing output pixels from respective pixels in each of said input frames.
2. A video processing apparatus according to claim 1, characterised in that said control image frame in said store is generated by a video graphics system (20, 21, 22).
3. A video processing apparatus according to claim 2, characterised in that said video graphics system includes manually operable input means in the form of a stylus (21) and a touch tablet (22).
4. A video processing apparatus according to claim 1, characterised in that said control value (D) rep-



resents the difference between the values of signals read from said store (14) and the value of the said time-variable count.

5. A video processing apparatus according to claim 4, characterised by a multiplier (43) for multiplying said control value (D) by a constant value (G) in order to produce a result which is used to control the deriving means in the combining of said input signals. 5
6. A video processing apparatus according to claim 5, wherein said keying processor is arranged such that the results of processing said signals are set to zero if a result is produced below zero and are set to unity if a result is produced above unity. 10
7. A video processing apparatus according to claim 1, characterised in that the keying processor (17) is adapted to determine from the control value a first parameter (K) having a range of values between predetermined limits above and below which the combined frames derived from the first and second input frame sequences contain respectively solely the frames of the second input sequence and the frames of the first input sequence, and in that there are provided a first adder (51) for adding a constant value to said first parameter to produce a sum, a first multiplier (52) for multiplying the sum by a constant value and a first subtractor (53) for subtracting a constant value from the multiplied sum, the first adder, first multiplier and first subtractor thereby obtaining a second parameter (K_A) from said first parameter, a second subtractor (60) for subtracting a constant value from said first parameter to produce a difference, and a second multiplier (61) for multiplying the difference by a constant value, the second subtractor and second multiplier thereby obtaining a third parameter (K_B) from said first parameter, said second and third parameters being variable in separated ranges of the value of the first parameter, first combining means (54, 55, 57, 58) for weighting a further input signal (C) with said second parameter (K_A), weighting the signal representing said first input frame sequence with the complement ($1-K_A$) of said second parameter and summing the signals so weighted to produce an output signal and second combining means (62, 63, 64, 65) for weighting the signal representing said second input frame sequence with said third parameter (K_B) and for weighting the output signal of the first combining means with the complement ($1-K_B$) of said third parameter and for summing the signals so weighted, whereby variation of the first parameter over its range effects in said output frame se-

quence a wipe of frames of the first with frames of second input frame sequence with a band of colour as represented by said further input signal between the respective portions of the frames of said input frame sequences comprising each frame of the output frame sequence.

8. A video processing apparatus according to claim 7, characterised in that variable gain means (G) are provided to vary the value of said parameters so as to vary the width of said band of colour in the wipe frames. 10
9. A video processing apparatus according to any preceding claim, wherein the counter (41) is arranged initially to contain a count value (R) identifying the number of output frames which are created from the respective frames of both input video sequences, and the counter (41) is operable to reduce said count between output frames thereby varying between output frames the proportions of the respective input frames (A, B) used to create the output frames. 15

Patentansprüche

1. Videoverarbeitungsgerät zur Erzeugung eines Überblendungseffektes, in dem jedes Bild einer Ausgangsvideosequenz aus entsprechenden Bildern zweier Eingangsvideosequenzen (A, B) derart erzeugt wird, daß ein Teil jedes Bildes jeder Eingangssequenz einen jeweiligen Teil des entsprechenden Ausgangsbildes einnimmt, wobei die Größe des Teils der Bilder einer Eingangssequenz zeitlich zunimmt und die Größe des Teils der Bilder der anderen Eingangssequenz entsprechend zeitlich abnimmt und die Bilder in jeder Videosequenz jeweils eine Vielzahl von Bildelementen umfassen, gekennzeichnet durch einen Speicher (14) zur Speicherung eines Steuerbildes, das die Form jedes der Bildteile repräsentiert und eine Vielzahl von Steuerbildelementen umfaßt; und einen Prozessor (17) umfassend einen einstellbaren Zähler (41) zur Erzeugung einer zeitlich variablen Zählung, einen Komparator (42) zum Vergleich der Zählung mit dem Wert von Steuerbildelementen zwecks Ableitung eines Steuerwertes (D) für jedes Bildelement in der Ausgangsvideosequenz, der den jedem Bildpunkt in jedem Ausgangsbild durch jeweilige Bildpunkte in jedem der Eingangsbilder hinzuzufügenden Beitrag repräsentiert, sowie einen von dem Steuerwert angesteuerten Kombinerer (44-47) zur Erzeugung von Ausgangsbildpunkten aus jeweiligen Bildpunkten in jedem der Eingangsbilder. 20



2. Videoverarbeitungsgerät nach Anspruch 1, dadurch gekennzeichnet, daß das Steuerbild im Speicher durch ein Videographiksystem (20, 21, 22) erzeugt wird.
3. Videoverarbeitungsgerät nach Anspruch 2, dadurch gekennzeichnet, daß das Videographiksystem manuell betätigbare Eingangsmittel in Form eines Stiftes (21) und einer Berührungsplatte (22) enthält.
4. Videoverarbeitungsgerät nach Anspruch 1, dadurch gekennzeichnet, daß der Steuerwert (D) die Differenz zwischen den aus dem Speicher (14) gelesenen Signalwerten und des Wertes der zeitlich variablen Zählung repräsentiert.
5. Videoverarbeitungsgerät nach Anspruch 4, gekennzeichnet durch einen Multiplizierer (43) zur Multiplikation des Steuerwertes (D) mit einem konstanten Wert (G) zwecks Erzeugung eines Ergebnisses, das zur Steuerung der Ableitmittel bei der Kombination der Eingangssignale verwendet wird.
6. Videoverarbeitungsgerät nach Anspruch 5, dadurch gekennzeichnet, daß der Tastprozessor so ausgebildet ist, daß die Verarbeitungsergebnisse der Signale auf Null gesetzt werden, wenn ein Ergebnis unter Nuller erzeugt wird, und auf Eins gesetzt werden, wenn ein Ergebnis über Null erzeugt wird.
7. Videoverarbeitungsgerät nach Anspruch 1, dadurch gekennzeichnet, daß der Tastprozessor (17) zur Bestimmung eines ersten Parameters (K) aus dem Steuerwert mit einem Wertebereich zwischen vorgegebenen Grenzen oberhalb und unterhalb von denen die aus der ersten und zweiten Eingangsbildsequenz abgeleiteten kombinierten Bilder jeweils lediglich die Bilder der zweiten Eingangssequenz bzw. die Bilder der ersten Eingangssequenz enthalten, und daß ein erster Addierer (51) zur Addition eines konstanten Wertes zum ersten Parameter zwecks Erzeugung einer Summe, ein erster Multiplizierer (52) zur Multiplikation der Summe mit einem konstanten Wert, ein erster Subtrahierer (53) zur Subtraktion eines konstanten Wertes von der multiplizierten Summe, wobei der erste Addierer, der erste Multiplizierer und der erste Subtrahierer einen zweiten Parameter (K_A) aus dem ersten Parameter erzeugen, ein zweiter Subtrahierer (60) zur Subtraktion eines konstanten Wertes vom ersten Parameter zwecks Erzeugung einer Differenz und ein zweiter Multiplizierer (61) zur Multiplikation der Differenz mit einem konstanten Wert, wobei der zweite Subtrahierer und der zweite Multiplizierer

zuer einen dritten Parameter (K_B) aus dem ersten Parameter erzeugen und der zweite und dritte Parameter in getrennten Bereichen des ersten Parameters variabel sind, erste Kombinationsmittel (54, 55, 57, 58) zur Wichtung eines weiteren Eingangssignals (C) mit dem zweiten Parameter (K_A), Wichtung des die erste Eingangsbildsequenz repräsentierenden Signals mit dem Komplement ($1-K_A$) des zweiten Parameters und Summation der so gewichteten Signale zwecks Erzeugung eines Ausgangssignals und zweite Kombinationsmittel (62, 63, 64, 65) zur Wichtung des Ausgangssignals der ersten Kombinationsmittel mit dem Komplement ($1-K_B$) des dritten Parameters und Summation der so gewichteten Signale vorgesehen sind, wodurch eine Änderung des ersten Parameters über seinen Bereich in der Ausgangsbildfolge eine Überblendung von Bildern der ersten mit Bildern der zweiten Eingangsbildfolge mit einem durch das weitere Eingangssignal repräsentierten Farbband zwischen den jeweiligen Teilen der Bilder der jedes Bild der Ausgangsbildsequenz umfassenden Eingangsbildsequenzen bewirkt.

8. Videoverarbeitungsgerät nach Anspruch 7, dadurch gekennzeichnet, daß Mittel (G) mit variabler Verstärkung vorgesehen sind, um den Wert der Parameter so zu ändern, daß die Breite des Farbbandes in den überblendeten Bildern geändert wird.
9. Videoverarbeitungsgerät nach den vorhergehenden Ansprüchen, in dem der Zähler (41) anfänglich einen Zählwert (R) enthält, welcher die Anzahl von aus jeweiligen Bildern beider Eingangsvideosequenzen erzeugten Ausgangsbildern identifiziert, und der Zähler (41) die Zählung zwischen Ausgangsbildern reduziert, wodurch zwischen Ausgangsbildern die Anteile der jeweiligen Eingangsbilder (A, B) zwecks Erzeugung der Ausgangsbilder variiert werden.

Revendications

1. Appareil de traitement vidéo destiné à créer un effet d'essuyage, dans lequel chaque trame d'une séquence vidéo de sortie est créée à partir des trames respectives de deux séquences vidéo d'entrée (A, B), de façon qu'une partie de chaque trame de chaque séquence d'entrée occupe une partie respective de la trame de sortie correspondante, la taille de la partie des trames d'une séquence d'entrée augmentant, et la taille de la partie des trames de l'autre séquence d'entrée diminuant dans le temps de façon correspondante, les trames de chaque séquence vidéo compre-



nant chacune plusieurs éléments d'image,

l'appareil étant caractérisé par une mémoire (14) destinée à stocker une trame d'image de contrôle, représentant la forme de chacune desdites parties d'image, et comprenant plusieurs éléments d'image de contrôle; et un processeur (17) comprenant un compteur réglable (41) destiné à fournir un comptage variable dans le temps, un comparateur (42) destiné à comparer le comptage à la valeur des éléments de l'image de contrôle, afin de déduire une valeur de contrôle (D) pour chaque élément d'image de la séquence vidéo de sortie, laquelle valeur représente la contribution à appliquer à chaque pixel de chaque trame de sortie par les pixels respectifs de chacune desdites trames d'entrée, et un dispositif de combinaison (44-47) sensible à ladite valeur de contrôle, destiné à produire des pixels de sortie d'après les pixels respectifs de chacune desdites trames d'entrée.

2. Appareil de traitement vidéo selon la revendication 1, caractérisé en ce que ladite trame d'image de contrôle située dans ladite mémoire est générée par un système graphique vidéo (20, 21, 22).
3. Appareil de traitement vidéo selon la revendication 2, caractérisé en ce que ledit système graphique vidéo comporte un moyen d'entrée pouvant être actionné manuellement sous forme d'un stylo (21) et d'une tablette sensible (22).
4. Appareil de traitement vidéo selon la revendication 1, caractérisé en ce que ladite valeur de contrôle (D) représente la différence entre les valeurs des signaux lus dans ladite mémoire (14), et la valeur dudit comptage variable dans le temps.
5. Appareil de traitement vidéo selon la revendication 4, caractérisé par un multiplicateur (43), destiné à multiplier ladite valeur de contrôle (D) par une valeur constante (G), afin de produire un résultat qui est utilisé pour commander le moyen de déduction dans l'association desdits signaux d'entrée.
6. Appareil de traitement vidéo selon la revendication 5, dans lequel ledit processeur de manipulation est aménagé de façon que les résultats du traitement desdits signaux soient fixés à zéro si un résultat est produit en dessous de zéro, et soient fixés à l'unité si un résultat est produit au-dessus de l'unité.
7. Appareil de traitement vidéo selon la revendication 1, caractérisé en ce que le processeur de manipulation (17) est adapté pour déterminer d'après la valeur de contrôle, un premier paramètre

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tre (K) ayant une plage de valeurs situées entre des limites prédéterminées au-dessus et en-dessous desquelles les trames associées déduites de la première et de la seconde séquences de trames d'entrée ne contiennent respectivement que les trames de la seconde séquence d'entrée et les trames de la première séquence d'entrée, et en ce qu'il est prévu un premier additionneur (51) destiné à ajouter une valeur constante audit premier paramètre afin de produire une somme, un premier multiplicateur (52) destiné à multiplier la somme par une valeur constante, et un premier soustracteur (53) destiné à soustraire une valeur constante de la somme multipliée, le premier additionneur, le premier multiplicateur, et le premier soustracteur obtenant par ce moyen un second paramètre (K_A) à partir dudit premier paramètre, un second soustracteur (60) destiné à soustraire une valeur constante dudit premier paramètre afin de produire une différence, et un second multiplicateur (61) destiné à multiplier la différence par une valeur constante, le second soustracteur et le second multiplicateur obtenant par ce moyen un troisième paramètre (K_B) à partir dudit premier paramètre, lesdits second et troisième paramètres étant variables selon des plages indépendantes de la valeur du premier paramètre, un premier moyen d'association (54, 55, 57, 58) destiné à pondérer un autre signal d'entrée (C) avec ledit second paramètre (K_A), à pondérer le signal représentant ladite première séquence de trames d'entrée avec le complément ($1-K_A$) dudit second paramètre, et à ajouter les signaux ainsi pondérés afin de produire un signal de sortie, et un second moyen d'association (62, 63, 64, 65) destiné à pondérer le signal représentant ladite seconde séquence de trames d'entrée avec ledit troisième paramètre (K_B), et à pondérer le signal de sortie du premier moyen d'association avec le complément ($1-K_B$) dudit troisième paramètre, et à ajouter les signaux ainsi pondérés, ce par quoi une variation du premier paramètre sur sa plage effectue dans ladite séquence de trames de sortie un essuyage des trames de la première avec les trames de la seconde séquence de trames d'entrée, avec une bande de couleur comme représenté par ledit autre signal d'entrée, entre les parties respectives de la trame desdites séquences de trames d'entrée comprenant chaque trame de la séquence de trames de sortie.

8. Appareil de traitement vidéo selon la revendication 7, caractérisé en ce qu'un moyen à gain variable (G) est prévu pour faire varier la valeur desdits paramètres, de façon à faire varier la largeur de ladite bande de couleur dans les trames d'essuyage.



9. Appareil de traitement vidéo selon l'une quelconque des revendications précédentes, dans lequel le compteur (41) est initialement aménagé pour contenir une valeur de comptage (R) identifiant le nombre de trames de sortie qui sont créées à partir des trames respectives des deux séquences d'entrée vidéo, et le compteur (41) fonctionne en diminuant ledit comptage entre les trames de sortie, faisant ainsi varier entre les trames de sortie la proportion des trames d'entrée respectives (A, B) utilisées pour créer les trames de sortie.

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