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**Datasheet for the decision
of 15 January 2009**

Case Number: T 0802/06 - 3.4.03

Application Number: 97112518.2

Publication Number: 0821340

IPC: G09G 5/18

Language of the proceedings: EN

Title of invention:

Video signal processing apparatus for converting video signals
to conform to a display device

Patentee:

Hitachi, Ltd., et al

Opponent:

IGR GmbH & Co. KG

Headword:

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Relevant legal provisions:

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Relevant legal provisions (EPC 1973):

EPC Art. 56

Keyword:

"Inventive step (no)"

Decisions cited:

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Catchword:

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Case Number: T 0802/06 - 3.4.03

DECISION
of the Technical Board of Appeal 3.4.03
of 15 January 2009

Appellant: Hitachi, Ltd.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 29 March 2006
revoking European patent No. 0821340 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: G. Eliasson
Members: R. Q. Bekkering
T. Bokor

Summary of Facts and Submissions

- I. This is an appeal against the revocation of EP 0 821 340 for lack of an inventive step over
- D3: EP 0 709 825 A, and
- D4: Kasai N et al, "26.4L: Late-News Paper: Development of 13.3-In. Super TFT-LCD Monitor" SID International Symposium, Digest Of Technical Papers, San Diego, May 12-17, 1996, Vol. 27, 12 May 1996, Society for Information Display, pages 414-417.
- II. The appellant proprietor requested in writing that the decision under appeal be set aside and the patent maintained in the following version:
- Main request:
- Claims 1 to 8 filed during the oral proceedings before the opposition division,
- First auxiliary request:
- Claims 1 to 8 filed with the statement of grounds of appeal.
- III. The respondent opponent requested dismissal of the appeal.
- IV. Oral proceedings were held before the board in the forewarned absence of the appellant proprietor.

V. Claim 1 of the main request reads as follows:

"A video signal processing apparatus (9) comprising an analog-to-digital conversion means (2) for sampling an inputted video signal (B) by a predetermined sampling frequency to convert the video signal into a digital signal, and a picture image magnifying circuit (5, 6) for performing picture element interpolation upon an output signal from said analog-to-digital conversion means to magnify the video signal vertically and horizontally, an output of said picture image magnifying circuit being supplied to a display device (8), wherein said video signal processing apparatus further comprises:

- (a) a sampling frequency control means (3) for controlling the sampling frequency to vary in accordance with an identification signal indicating a sort of the video signal,
- (b) a controller (7) for controlling the picture element interpolation of the picture image magnifying circuit on the basis of the identification signal indicating the sort of the video signal

characterized in that the sort of the video signal includes a colour television signal and a personal computer video signal and that the controller controls the picture element interpolation of the video signal for vertical direction and the picture element interpolation of the video signal for horizontal direction, respectively, using a vertical magnification ratio (K1) and a horizontal magnification ratio (K2) corresponding to the sort of video signal, set individually on the basis of the identification signal."

VI. Claim 1 of the auxiliary request corresponds to claim 1 of the main request with the following addition at the end of the claim:

"the identification signal corresponding to the inputted video signal being inputted from outside the video signal processing apparatus".

VII. The appellant patent proprietor argued as follows:

The appealed decision only picked out two features to argue lack of inventive step and failed to argue on the basis of all features of the claim in combination. Moreover, as to the first feature relating to the sort of video signal including a colour television signal, a colour television signal could for instance include field information in case a picture was put together from two different half pictures, as for example in the NTSC standard. As D4 was only concerned with PC video signals, and for example video signals according the VGA and SVGA standard included full pictures at a given rate, the apparatus of D4 was not compatible with colour television signals and could not be modified in a routine manner to accommodate such signals.

As to the second feature relating to the vertical and horizontal magnification ratios being set individually on the basis of the identification signal, document D4 did not provide a suitable starting point as it did not deal with different video signals. Document D3 failed to disclose any identification signal and thus could not hint at the claimed invention either. Accordingly,

the subject-matter of claim 1 of the main request was based on an inventive step.

Regarding claim 1 of the auxiliary request, document D4 did not disclose any signal corresponding to the identification signal according to the invention. In particular, neither the CRT i/f signal nor the control signal in D4 corresponded to the identification signal. Document D3 did not disclose any identification signal indicating the sort of video signal either. The subject-matter of claim 1 of the auxiliary request was, therefore, also based on an inventive step.

VIII. The respondent opponent argued as follows:

Although the appellant proprietor was correct in stating that colour television signals could include half-frame signals, and PC video signals full-frame signals, it was also known to transmit colour television signals in full-frame mode. Accordingly, both PC video and colour TV signals could be in full-frame mode and, thus, be fundamentally of the same sort. As a consequence both could be processed by the D4 apparatus without difficulty. A person skilled in the art, starting from D4, faced with the problem of displaying video signals according to as many standards as possible, including 16:9 TV signals, on one and the same 4:3 display, would have considered document D3 disclosing the use of different magnification factors in the vertical and horizontal direction. Accordingly, the subject-matter of claim 1 of the main request lacked an inventive step.

As far as claim 1 of the auxiliary request was concerned, the provision of an identification signal being inputted from outside as claimed included the input via a control unit. Document D4 already provided for inputting an identification signal corresponding to the inputted video signal by means of key switches and thus from outside the video signal processing apparatus. Accordingly, also the subject-matter of claim 1 of the auxiliary request lacked an inventive step.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request*
 - 2.1 *Novelty, inventive step*
 - 2.2 *Document D4*

Document D4 discloses an LCD monitor interface circuit allowing an LCD monitor to be connected to a PC with conventional CRT interface and to display data of every kind of resolution (VGA (640x480), SVGA (800x600) and XGA (1024x768) on an XGA LCD (page 414, "Abstract" and "Introduction").

As disclosed in D4, *"An analog circuit converts the CRT interface signal to digital signal and generates synchronous signals (Vsync, Hsync, Dot Clock). A digital circuit processes the data from analog circuit to expand the original resolution to XGA resolution, and processes to multiply display colors by FRC.*

Regulation processor generates control signal from CRT i/f signal and the state of key switches to regulate for analog and digital circuit." (page 414, "LCD Monitor Interface Circuit").

Accordingly, document D4 discloses, using the terminology of claim 1, a video signal processing apparatus comprising:

- an analog-to-digital conversion means ("A/D converter", figure 2) for sampling an inputted video signal ("Analog Data", figure 2) by a predetermined sampling frequency (PLL output set by control signal from regulation processor (figures 1, 2 and page 415, left-hand column, third paragraph)) regulated to convert the video signal into a digital signal, and
- a picture image magnifying circuit ("Expand Processor", figure 3) for performing picture element interpolation upon an output signal from said analog-to-digital conversion means to magnify the video signal vertically and horizontally (figures 4, 5),
- an output of said picture image magnifying circuit being supplied to a display device ("Super TFT-LCD", figure 1), wherein said video signal processing apparatus further comprises:
 - (a) a sampling frequency control means (PLL, figure 2) for controlling the sampling frequency to vary in accordance with an identification signal (control signal) indicating a sort of the video signal (figures 1, 2 and page 415, left-hand column, third paragraph),
 - (b) a controller ("Expand Processor", figure 3) for controlling the picture element interpolation of the picture image magnifying circuit on the basis of the identification signal indicating the sort of the video signal ("Control signal", figure 3).

Furthermore, the controller ("Expand Processor", figure 3) controls the picture element interpolation of the video signal for vertical direction and the picture element interpolation of the video signal for horizontal direction, respectively, using a vertical magnification ratio and a horizontal magnification ratio (figures 4, 5 and corresponding description) corresponding to the sort of video signal, set on the basis of the identification signal ("Control Signal" supplied to "Expand Processor", figure 3).

In document D4 the same vertical magnification ratio and horizontal magnification ratio is used so as to keep the same aspect ratio (page 415, right-hand column, last paragraph).

Furthermore, document D4 only addresses video signals from a personal computer or work station. The input of a colour television signal is not mentioned.

2.3 Accordingly, the difference between the subject-matter of claim 1 and document D4 is that:

- the sort of the video signal also includes a colour television signal, and
- the vertical magnification ratio and the horizontal magnification ratio are set **individually** on the basis of the identification signal.

The subject-matter of claim 1 of the main request is thus new over document D4 (Articles 54(1) and (2) EPC 1973).

2.4 The effect of the first difference is that the apparatus handles more video standards. The effect of the second difference is that it allows different video formats (image aspect ratios) to be displayed on the TFT-LCD in eg full-screen mode (ie filling the entire screen and eliminating any black bars at the screen top/bottom (letterbox format) or sides).

The objective problem to be solved relative to document D4 thus relates to displaying video signals of as many video standards as possible on the same display unit in full-screen mode.

The formulation of the problem *per se* is obvious to the person skilled in the art, as at the filing date of the patent in suit, with the growing multimedia market and the increasing merging of PC, TV and other video applications, there was a demand for display units able to handle as many video standards as possible including PC and TV signals and display the various video formats in full-screen mode so as to eliminate any black bars typically perceived as disturbing.

Since analog PC video signals and colour TV signals have a fundamentally identical structure, in the board's judgment the person skilled in the art would not have any difficulty in adapting the apparatus of D4 to be compatible with colour television signals as well.

The appellant patent proprietor argued that a colour television signal could consist of half-frames and thus differed from a personal computer signal typically consisting of full frames. The apparatus of Document D4

was not suitable and not easily modified for dealing with half-frames.

It is, however, noted that, as pointed out by the respondent opponent, colour television signals can also be provided in full-frame mode (also known as "progressive scan") and thus comparable to PC video signals in this respect. Moreover, interlacing is well known to a person skilled in the art of video signal processing, so that in the board's judgement it would not constitute an obstacle to the skilled person wishing to adapt the apparatus of D4 to be compatible with interlaced (half-frame) TV signals as well.

As in particular TV signals come in different formats (image aspect ratio 4:3 for conventional TV signals, 16:9 for widescreen etc...), the need arises consequentially to display these formats without any black bars on the top/bottom or sides of the display screen, as such black bars are generally perceived as disturbing.

The person skilled in the art would accordingly look in the prior art for solutions.

2.5 *Document D3*

Document D3 discloses a video scaling device for up- or downscaling digital video images to be displayed. According to D3, *"A digital video image comprises an array of pixels, with the number of pixels in each horizontal row and vertical column being determined by the system in which the image is formed. When the image is to be displayed in a system that uses the same*

number of pixels in each row as the input image and the same number of pixels in each column as the input image, the image may be displayed directly. However, when the image is to be displayed in a system that uses a different number of pixels in each row and/or a different number of columns as the input image, the image must be scaled so that the same image can be displayed in the new array of pixels. For example, an image comprising a 500 by 750 array of pixels must be scaled up before it can be displayed in a system that uses an array of 750 by 900 pixels. Conversely, the same image may need to be scaled down before it can be displayed in a system using an array of only 250 by 350 pixels. As is apparent, the horizontal and vertical scaling factors may not be the same."(page 2, lines 6 to 14).

As can be seen from the examples given, document D3 thus allows filling the entire display where the image data and the display have different aspect ratios.

- 2.6 Accordingly, document D3 discloses a system in which the vertical magnification ratio and the horizontal magnification ratio are set individually allowing different image formats (image aspect ratios) to be displayed in full-screen mode.

It would, thus, be obvious to the person skilled in the art to include this feature in the video processing apparatus of document D4 in order to solve the above objective problem.

Moreover, it would be obvious to the skilled person to set these magnifications on the basis of the

identification (control) signal available in the D4 apparatus, as this signal is already available and indicative of the sort of video signal and, thus, of its image aspect ratio.

Accordingly, the subject-matter of claim 1 of the main request is obvious to a person skilled in the art and, thus, lacks an inventive step in the sense of Article 56 EPC 1973.

The appellant patent proprietor's main request is, therefore, not allowable

3. *Auxiliary request*

3.1 Claim 1 of the auxiliary request contains the following addition:

"the identification signal corresponding to the inputted video signal being inputted from outside the video signal processing apparatus".

3.2 According to document D4 the control signal is generated by the regulation processor from the CRT interface signal and from regulations selected by the user by means of key switches through an OSD (On Screen Display) function or by serial data transfer from the PC or workstation (page 414, right-hand column, last paragraph; page 417, "Regulation function"). These regulations may in particular include *"the number of dot clock in one horizontal period for the PLL circuit"* and, thus, correspond to the inputted video signal.

Accordingly, in D4 the control signal, ie "*the identification signal corresponding to the inputted video signal*" is inputted from outside the video signal processing apparatus as per claim 1 of the auxiliary request.

Accordingly, the subject-matter of claim 1 of the auxiliary request also lacks an inventive step in the sense of Article 56 EPC 1973.

The appellant patent proprietor's auxiliary request is, therefore, not allowable either.

Order

For these reasons it is decided that:

The appeal is dismissed.

Registrar

Chair

S. Sánchez Chiquero

G. Eliasson