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D E C I S I O N
of 20 January 2006

Case Number: T 0686/02 - 3.5.01

Application Number: 95119131.1

Publication Number: 0716545

IPC: H04N 7/01

Language of the proceedings: EN

Title of invention:

Video signal aspect ratio conversion apparatus

Applicant:

SONY CORPORATION

Opponent:

-

Headword:

Aspect ratio conversion/SONY

Relevant legal provisions:

EPC Art. 56, 123(2)

Keyword:

"Added subject-matter (yes - all requests)"

"Inventive step (no - all requests)"

Decisions cited:

-

Catchword:

-



Case Number: T 0686/02 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 20 January 2006

Appellant: SONY CORPORATION
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 1 January 2002
refusing European application No. 95119131.1
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. Steinbrener
Members: W. Chandler
A. Pignatelli

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse the application on the grounds that the subject-matter of the independent claims of the main and second auxiliary requests did not involve an inventive step (Article 56 EPC) having regard to the following documents:

D1: GB-A-2 257 325

D2: US-A-5 347 318

D3: EP-A-0 545 897

and that the subject-matter of the independent claims of the first auxiliary request was not new (Article 54 EPC) over D1.

II. The appellant (applicant) lodged an appeal against the decision and paid the prescribed fee. With the grounds of appeal, the appellant filed a new main, first and second auxiliary request.

III. In reply to the Board's communication accompanying the summons to oral proceedings and setting out the issues to be discussed, the appellant submitted revised claims of a main and first and second auxiliary request.

IV. At the oral proceedings, the appellant requested that the decision under appeal be set aside and a patent granted based on claims 1 and 11 of a main, first or second auxiliary request, all submitted during the oral proceedings.

At the end of the oral proceedings, the Chairman announced the decision.

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

"Apparatus for converting an aspect ratio of an input video signal which contains partial area information representing a partial area manually selected by an editor as the most essential portion of said input video signal into a converted video picture with the aspect ratio corresponding to a receiver aspect ratio of a television receiver, said apparatus comprising:

decoder means (4, 19) for decoding said partial area information from said input video signal;

addressable memory means (15, 16) for storing a video signal;

read address generator means (20) responsive to the decoded partial area information for generating addresses representing those locations in said memory means (15, 16) in which are stored the video signal constituting said partial area so as to read out said partial area video signal;

processing means (5) for processing said partial area video signal to form an output video signal with said converted aspect ratio,
characterized by,

the selection as the partial area being selecting said partial area in the display area as displayed by the television receiver at an arbitrary position circumscribed by borders of the input video picture,

Y/C separator means (11) for separating the input video signal into a luminance signal and a chrominance signal;

means (12, 14) for supplying samples of said luminance signal and said chrominance signal to said memory means (15, 16); and

luminance signal and chrominance signal interpolating means (21, 22) for receiving and interpolating the luminance samples and chrominance samples read from said memory means (15, 16) according to said partial area information."

Claim 1 of the first auxiliary request reads as follows:

"Apparatus for converting an input video picture having an input aspect ratio, represented by an input video signal which contains an identification signal indicating the aspect ratio of said input video picture, and a partial area information representing a partial area manually selected by an editor as the most essential portion of said input video picture into a converted video picture with a converted aspect ratio corresponding to a receiver aspect ratio of a television receiver, the selection as the partial area being selecting said partial area in the display area as displayed by the television receiver at an arbitrary position circumscribed by borders of the input video picture, said apparatus comprising:

decoder means (4; 13, 19) for decoding said partial area information from said input video signal;

addressable memory means (15, 16) for storing samples of said input video signal;

read address generator means (20) responsive to the decoded partial areas information for generating addresses representing those locations in said addressable memory means in which are stored the samples constituting said partial area manually

selected by an editor as the most essential portion of said input video picture so as to read out said partial area samples;

processing means (5; 21-28) for detecting said input aspect ratio of said input video picture and said receiver aspect ratio, for selecting a mode of aspect ratio conversion based on the detected input aspect ratio of said input video picture and said receiver aspect ratio, and for converting said partial area samples to said converted video picture with said converted aspect ratio in accordance with the mode of aspect ratio conversion selected such that said partial area information of said input video picture manually selected by said editor is the information in the converted video picture; and

an identification signal output means (7, 8) adapted to rewrite said identification signal in order to indicate the picture display format and the aspect ratio into which the partial area of the input video picture has been converted, and to add said rewritten identification signal to said converted video picture."

Claim 1 of the second auxiliary request reads as follows:

"Apparatus for converting an input video picture having an input aspect ratio, represented by an input video signal which contains partial area information representing a partial area manually selected by an editor as the most essential portion of said input video picture, into a converted video picture with a converted aspect ratio corresponding to a receiver aspect ratio of a television receiver, the selection as the partial area being selecting said partial area in

the display area as displayed by the television receiver at an arbitrary position circumscribed by borders of the input video picture, said apparatus comprising:

decoder means (4; 13, 19) for decoding said partial area information from said input video signal;

addressable memory means (15, 16) for storing samples of said input video signal;

read address generator means (20) responsive to the decoded partial area information for generating addresses representing those locations in said addressable memory means in which are stored the samples constituting said partial area manually selected by an editor as the most essential portion of said input video picture so as to read out said partial area samples;

interpolating means (21, 22) for interpolating samples constituting said partial area; and

processing means (5; 21-28) for detecting said input aspect ratio of said input video picture and said receiver aspect ratio, for selecting a mode of aspect ratio conversion based on the detected input aspect ratio of said input video picture and said receiver aspect ratio, and for converting said partial area samples to said converted video picture with said converted aspect ratio in accordance with the mode of aspect ratio conversion selected such that the most essential portion of said input video picture manually selected by said editor is the information in the converted video picture, wherein said processing means is adapted to select a mode of aspect conversion for converting the input video picture to the television receiver video picture, wherein the interpolating means (21, 22) is adapted to interpolate the samples in order

to enlarge said partial area in the horizontal and vertical direction so that said partial area fills the entire of said receiver aspect ratio of the television receiver without distortion."

VI. The appellant argued essentially as follows:

The examining division had not appreciated the main idea of the invention, which was the selection of an arbitrary image portion from an original picture with a first aspect ratio and its conversion and enlargement to fit a display area with a different aspect ratio as shown in Figure 10. The expression "partial area manually selected by an editor as the most essential portion of said input video picture", present in claim 1 of all requests, expressed the idea of this selection of the arbitrary image portion. This had been further clarified by the amendment made during the oral proceedings, which was based on the definition of the third mode in the second auxiliary request filed with the grounds of appeal.

The example shown in Figure 13 of D1 and described at page 15, lines 6 to 12 did not unambiguously disclose enlarging the selected portion to fit the display area, but could have meant a selection using a simple scrolling.

Concerning claim 1 of the main request, D1 also left open the way the signals were processed. Furthermore, none of the prior art showed Y/C processing or interpolation in the context of a selection of an arbitrary partial area.

Claim 1 of the first auxiliary request specified an identification signal indicating the aspect ratio of the input picture. The signal was rewritten after conversion to identify the new aspect ratio to prevent a television from performing a second conversion. This made sense in a system with a television that could read the ID signal and could perform an aspect ratio conversion, but not as well as the present invention, e.g. one not capable of selecting an arbitrary partial area. Although D1 disclosed an identification signal, there was no hint to rewrite it into the converted signal.

Claim 1 of the second auxiliary request further clarified the selection of the partial area and specified that it was displayed on the receiver without distortion.

Reasons for the Decision

1. The appeal complies with the requirements referred to in Rule 65(1) EPC and is, therefore, admissible.

2. The application relates to aspect ratio conversion of a video signal, e.g. in order to display a widescreen image on a normal television display or vice versa. Figures 8, 9 and 10 of the description show three embodiments in which part of an original picture is selected to be displayed on a display area having a different aspect ratio. This involves either a selection in the horizontal (Figure 8), vertical (Figure 9) direction or both (Figure 10), depending on the conversion.

3. It is common ground that D1, by the same applicant, discloses a selection in the horizontal direction (see in particular Figures 8 and 9) and in both directions (see Figure 13).

Admissibility of amendments (all requests)

4. Before the oral proceedings it did not appear to be in dispute that the invention according to the main request differed from D1 by the features of the characterising portion of claim 1. These differences concerned the manner of processing the Y and C signals. However, at the oral proceedings the appellant argued that the invention was primarily concerned with the selection of the partial area. In particular, the invention enabled the selection of an *arbitrarily sized* image portion from the input picture as shown in Figure 10, which was said not to be disclosed in D1 (see point VI, above).
5. In response to the Board's doubts that the wording "partial area manually selected by an editor as the most essential portion of said input video picture" expressed such a selection, but excluded the Figure 8 and 9 embodiments, at least one of which was disclosed in D1, the appellant amended the definition of the selection of the partial area in all requests with the following wording:

"selecting said partial area in the display area as displayed by the television receiver at an arbitrary position circumscribed by borders of the input video picture".

6. Although this feature specifies that the selected partial area is from within the input video picture, the wording also implies that the selection of the partial area is also in some way dependent on the display area. Moreover, the appellant appeared to be defending this dependency based on the disclosure of Figure 10. However, apart from the fact that the area that is selected is to be finally displayed on the television, the Board judges that there is no support in the originally filed disclosure for a selection related to the boundaries of the display area. In the Board's judgement the display area drawn in Figure 10 only serves to show the relative aspect ratios of the original picture and the display area and does not disclose a limitation of the selected area to any part of the original picture. The appellant was not able to show any support for his interpretation in the rest of the description either.

7. This amendment accordingly extends beyond the content of the originally filed application, so that none of the requests are allowable (Article 123(2) EPC).

Inventive step

8. Even interpreting the amendment in the appellant's sense as meaning that the partial area *to be displayed* is an arbitrary portion of the input picture, notwithstanding the fact that the claim also only specifies an arbitrary *position*, the Board judges that claim 1 of the main and first and second auxiliary request lack an inventive step. The essential reasons for this are given below.

Firstly, contrary to the appellant's view, the Board judges that such a selection is disclosed in D1. The text of the Figure 13 embodiment at page 15, lines 6 to 12 states that information representing *magnification* is transmitted *in addition* to the central position information and that the size of the cutting-out range may be set by this magnification information. In the Board's view this is a clear disclosure that the cutting-out range (partial area) can vary in size and is enlarged to fit the display area. The Board cannot agree with the appellant's view that this could mean a selection using a simple scrolling as in the previous embodiments because the term "magnification" implies a change in size. Furthermore the magnification feature is described as being "in addition" to the scrolling embodiments.

9. Regarding the distinguishing features of claim 1 of the main request, the Board agrees with the examining division that processing the Y and C signals separately, and hence the use of a Y/C separator, is a routine technique in the field of image processing (see e.g. D2, Figure 13 and column 12, lines 1 and 2, or D3, Figure 7 and page 7, lines 51 and 52). Furthermore, any digital processing technique would require the use of samples. Similarly, the remaining feature, added in appeal, of interpolating the samples read from the memory is also a standard technique in the field of image processing and is used when the number of samples needs to be changed (see for example D2, column 5, line 61 to column 6, line 15).

10. The first auxiliary request does not contain the features of the characterising part of the main request, but adds features of selecting a mode of conversion so that the partial area becomes the converted video picture (penultimate feature), and a feature relating to another aspect of the application, namely the use and rewriting of the identification signal representing the aspect ratio of the picture.

11. It follows from the above discussion (see point 8), that the Board judges that D1 discloses the first of these features. It was agreed that the second feature solved the problem of preventing a television that is capable of reading the ID signal from converting the video signal a second time.

12. The appellant agreed that this feature only made sense if the conversion apparatus were connected to a television that is capable of reading the ID signal. If the skilled person were to contemplate connecting such a television to the apparatus of D1, the Board judges that would be obvious to supply it with an appropriate ID signal. It is self evident from the nature of an ID signal that it should correctly reflect the current state of what it is identifying, namely the aspect ratio of the converted picture. Thus, it would be obvious to rewrite the ID signal in D1 to represent the converted picture.

13. The second auxiliary request does not contain the Y/C processing feature of the main request, nor does it contain the identification signal of the first auxiliary request. It specifies a mode of conversion in which the partial area samples are interpolated in

- order to enlarge the partial area so that it fills the display without distortion.
14. Apart from being an obvious desideratum, it is apparent that this can only be the case if the aspect ratio of the partial area is the same as that of the display. It follows from the above discussion (see point 8), that the Board judges that this would also be possible with the magnification in D1. Moreover, as explained in connection with the main request (see point 9), the skilled person would consider the use of interpolation to change picture sizes.
15. Since there are no other requests, it follows that the appeal must be dismissed.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar:

The Chairman:

P. Guidi

S. Steinbrener