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D E C I S I O N
of 6 June 1997

Case Number: T 0316/94 - 3.5.1

Application Number: 86306559.5

Publication Number: 0213912

IPC: H04N 11/00

Language of the proceedings: EN

Title of invention:

Video display system for wide and standard aspect ratio video signals

Patentee:

RCA Thomson Licensing Corporation

Opponent:

Societa Italiana per lo Sviluppo dell'Elettronica S.I.SV.EL.
S.p.A.
Interessengemeinschaft für Rundfunkschutzrechte E.V.

Headword:

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Relevant legal provisions:

EPC Art. 52(1), 56, 84, 114(2), 123(2), 123(3)

Keyword:

"Inventive step (yes)"
"Late-filed documents"

Decisions cited:

T 0536/88

Catchword:

-



Case Number: T 0316/94 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 6 June 1997

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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 15 March 1994
revoking European patent No. 0 213 912 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: A. S. Clelland
M. Lewenton

Summary of Facts and Submissions

I. European patent No. 0 213 912 was granted on the 21 November 1991. Subsequent to grant, two admissible oppositions were filed, both on the ground that the subject-matter of each of the claims of the patent was either not new or did not involve an inventive step (Article 100(a) EPC).

II. Both opponents referred *inter alia* to the following prior art document:

D1: JP-A-57-208772

a certified English translation was also filed with document D1.

In the course of the opposition proceedings opponent I (now respondent I) filed the following document, which the Opposition Division considered sufficiently relevant to admit to the proceedings:

D8: GB-A-1 218 293.

III. Following oral proceedings the Opposition Division, by a decision dated 15 March 1994, revoked the patent. The Division found that the subject-matter of independent claims 1, 13 and 14 lacked an inventive step having regard to the disclosure of D1.

IV. On 11 April 1994 the patentee lodged an appeal against this decision and paid the prescribed fee. On the 14 July 1994 a statement of the grounds of appeal was filed, together with sets of claims of a main request and first and second auxiliary requests.

V. Both respondents filed comments on the grounds of appeal. The following additional documents were cited:

D10: ITT product description "Integrierte Schaltungen für die Konsumelektronik", W6250/10/1D, 1978/79, pages 114 to 120.

D11: US-A-4 385 324

D12: SMPTE Journal, August 1984, pages 726 to 729, Nadan and Jackson, "Signal processing for wide-screen television: The smart receiver"

D13: DE-A-3 116 646.

VI. The parties were summoned to oral proceedings. In a communication accompanying the summons the rapporteur referred, in addition to various of the above documents, to the prior art acknowledged in the patent as granted:

D14: DE-A-3 305 498

an English-language equivalent US-A-4 551 754, which was however late-published, was primarily referred to by the parties.

VII. Prior to the oral proceedings the appellant filed revised sets of claims of a main request and several auxiliary requests. Claim 1 of the main request, as discussed at the oral proceedings, reads as follows:

"1. A video display system comprising:

a signal source (704, 706, 710) in use providing at times a first video signal representative of an image having a given aspect ratio (e.g. 4:3) and at other times a second video signal representative of an image having a greater aspect ratio (e.g. 5:3);

display means (730) having said greater aspect ratio and producing a single raster of said greater aspect ratio;

dual mode signal processing means responsive in a first operating mode to said first video signal for supplying a first processed video output signal to said display means for generating a display of said given aspect ratio image with no loss of picture data and responsive in a second operating mode to said second video signal for supplying a second processed video output signal to said display means for generating a display of said greater aspect ratio, each of said processed video output signals having line periods each including a line synchronizing interval and an active interval;

said signal processing means including, for displaying said image of given aspect ratio without effectively reducing said single raster of greater aspect ratio of said display means:

a digital memory arrangement (714, 716, 718); clock means (712, 720, 1008) for writing data of said given aspect ratio (4:3) image into said memory arrangement at a first rate (e.g. 910fH) and reading the said data from said memory arrangement at a second rate (e.g. 1100fH) faster than said first rate; and

means (402, D2, 1102) for also creating in each line period of said first video output signal a delay interval ("PAUSE") which is controllable by memory means (ROM) and which determines the position of the said image having the given aspect ratio within the width of said single raster."

VIII. At the oral proceedings, which took place on 11 July 1996, respondent II raised objections under Articles 84 and 123(2) EPC to the above claim. In the final paragraph of the claim reference is made to creating a delay interval "which is controllable by memory means" but, it was argued, the originally filed application

contained no disclosure of a controllable delay interval. Objection was also raised to the reference in the third paragraph of the claim to generating a display of a given aspect ratio image "with no loss of picture data".

- IX. In the course of the oral proceedings the appellant proposed various amendments to claim 1, which are codified in the revised claims subsequently received on 29 July 1996 (see below). The discussion on inventive step at the oral proceedings was largely based on the interpretation of claim 1 of the main request embodied in these revised claims.
- X. It was argued by the respondents that the single most relevant document was D12. Although it was arguably true that 16:9 picture tubes were not available at the time of publication of D12, it was nevertheless clear from Figures 1 and 2 that this document envisaged displaying images having different aspect ratios. As could be seen from page 727, central column, there was a technical disclosure of how to provide the required dual mode processing means in the form of a field store with a clock rate of 20.25 MHz but which could be clocked at rates of up to 40 MHz. Figure 2b implied compression of a "standard format" (i.e. 4:3) picture for standard line periods. It was clear that to read a 4:3 picture out of a frame store designed for 16:9 images implied reading out faster than writing in. Moreover, the final feature of claim 1 dealt with a quite different problem, that of positioning a 4:3 picture. It was obvious that if a digital store was used the location of the image could be controlled by control of the addressing. This was implicit in any system employing a frame store and had nothing to do with a dual mode receiver.

XI. The appellant argued that much of the prior art was non-enabling and that the combinations of documents being made by the respondents were impermissible. The documents primarily relied upon, D1 and D12, were over ten years old and should be read at the priority date of the application and not with the benefit of hindsight. The intention of these documents was to suggest uses for wide aspect ratio screens in order to give the consumer an incentive to buy wide screen televisions as and when they became available. The technical disclosure of both documents was minimal. Moreover, neither disclosed the display of a 4:3 picture alone and neither suggested a determinable position for the image, which was always at the extreme left or right. Although D12 did mention a field memory, it was not clear what function this memory was intended to fulfil; it was not comparable with the line memory used in the invention. In any case, neither D1 nor D12 actually disclosed a dual mode receiver: D1 was exclusively concerned with the display of 4:3 images on a wide screen and even suggested that the screen phosphor properties be changed for the auxiliary images, whilst in D12 Figure 1 was clearly a mock-up, intended to illustrate the difference in size between 4:3 and 16:9 images.

XII. At the end of the oral proceedings the Board announced its decision to continue the procedure in writing on the basis of appellant's requests, as submitted during the same oral proceedings.

XIII. The appellant requests that the patent be maintained on the basis of the main request or, failing that, one of four auxiliary requests to be taken in turn and as formulated and submitted at the oral proceedings and subsequently filed in retyped form on the 29 July 1996. In accordance with the appellant's main request claim 1, the single independent claim, reads as

follows:

"1. A video display system comprising:

a signal source (704, 706, 710) in use providing at times a first video signal representative of an image having a given aspect ratio (e.g. 4:3) and at other times a second video signal representative of an image having a greater aspect ratio (e.g. 5:3);

display means (730) having said greater aspect ratio and producing a single raster of said greater aspect ratio;

dual mode signal processing means responsive in a first operating mode to said first video signal for supplying a first processed video output signal to said display means for generating a display of said given aspect ratio image and responsive in a second operating mode to said second video signal for supplying a second processed video output signal to said display means for generating a display of said greater aspect ratio, each of said processed video output signals having line periods each including a line synchronizing interval and an active interval;

said signal processing means including, for displaying said image of given aspect ratio without effectively reducing said single raster of greater aspect ratio of said display means:

a digital memory arrangement (714, 716, 718); clock means (712, 720, 1008) for writing data of said given aspect ratio (4:3) image into said memory arrangement at a first rate (e.g. 910fH) and reading the said data from said memory arrangement at a second rate (e.g. 1100fH) faster than said first rate: and

means (D2, 1102) for also creating in each line period of said first video output signal a delay interval ("PAUSE") which is determined by memory means (402') and which controls the position of the said image having the given aspect ratio within the width of said single raster."

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the last paragraph is amended to read as follows:

"a control unit (1008) comprising means (1102) for also creating in each line period of said first video signal a delay interval ("PAUSE") and a memory means (402') connected to said creating means (1102), said delay interval being determined by said memory means (402') and controlling the position of said image having the given aspect ratio within the width of said single raster."

XIV. Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the last paragraph reads as follows:

"a control unit (1008) comprising means (1102) for also creating in each line period of said first video signal a delay interval ("PAUSE") and a memory means (402') connected to said creating means (1102), said memory means (402') having a bit pattern stored therein, said delay interval being determined by said bit pattern and controlling the position of said image having the given aspect ratio within the width of said single raster."

XV. Claim 1 of the third auxiliary request differs from claim 1 of the main request in that the last paragraph reads as follows:

"means (D2, 1102) for also creating in each line period of said first video output signal a delay interval ("PAUSE") which is determined by memory means (402') and which controls the position of the said image having the given aspect ratio within the width of said single raster so that the image is centred within the width of said single raster or shifted to the left or right of centre."

- XVI. Claim 1 of the fourth auxiliary request differs from claim 1 of the main request in that the dual mode signal processing means are specified as generating a display of a given aspect ratio image "with no loss or only slight loss of picture data".
- XVII. The independent claim of each request is accompanied by claims 2 to 13 as filed at the oral proceedings on 11 July 1996.
- XVIII. Both respondents request that the appeal be dismissed.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. *Late-filed documents*
 - 2.1 D10 and D11 were introduced for the first time by respondent II in the submission received on 30 November 1994, i.e. some three years after grant of the patent. D12 and D13 were introduced by respondent I in the submission received on 28 February 1995, and thus even later.
 - 2.2 The Board exercises its discretion under Article 114(2) EPC not to admit documents D11 and D13 to the proceedings; their objective relevance is not such as to justify their admission at a late stage. D10 and D12 on the other hand were the subject of intensive discussion by both sides in the written and oral procedures. They are accordingly admitted. It is

observed that although D11 is acknowledged prior art, it is not the closest prior art for the purpose of formulating the technical problem set out in the description, see T 536/88 OJ EPO 1992, 638. That document is D14.

3. *Amendments*

- 3.1 The final feature of claim 1 of the main request now refers to means for creating, in each line period of a video output signal, a delay interval "which is determined by memory means (402') and which controls the position of the said image...within the width of said single raster". This wording no longer contains the implication, the subject of much discussion at the oral proceedings, that the delay interval is adjustable in dependance on the memory means; on the other hand, the claim makes clear that it is the delay interval which effects positioning of the image within the width of the raster. The Board considers that with the present revised wording the claim is both clear and supported by the description in accordance with Article 84 EPC.
- 3.2 Claim 1 of each of the auxiliary requests uses the same or analogous wording. These claims accordingly also meet the requirements of Article 84 EPC.
- 3.3 The Board is satisfied that the patent as amended does not contain subject-matter which extends beyond the content of the application as filed (Article 123(2) EPC) and that the scope of protection has not been extended during the opposition and appeal procedures (Article 123(3) EPC).

4. *Inventive Step (main request)*

4.1 The patent is concerned with the field of extended-definition television or EDTV; by this is meant a television system using an existing encoding standard such as PAL or NTSC but with a wider aspect ratio, for example 5:3 in place of the standard 4:3. In such a system, problems arise on the one hand in providing downward compatibility for display of the EDTV signals on existing receivers and on the other hand in ensuring that 4:3 signals can be displayed satisfactorily on an EDTV receiver.

4.2 These problems, although related, are separate, and in the patent in suit they are solved by largely separate means. It is acknowledged in the patent as being known from D14 to solve the problem of downward compatibility by subjecting the wide-screen image to edge compression to give a 4:3 format for existing receivers. A flag signal is transmitted so that the compressed signals are recognised as such by an EDTV receiver and expanded back to 5:3. It is moreover acknowledged as being known from D14 to display standard images in EDTV receivers by reducing the raster width. This is however said in the patent in suit to give rise to the problem that the picture tube convergence may be affected.

4.3 Document D14 discloses the solution to the problem of downward compatibility which is adopted by the patent in suit, leaving the problem of the display of 4:3 images on a 5:3 screen without affecting the convergence. In detail, it discloses a video display system having a signal source, display means and dual mode signal processing means in accordance with the first 15 lines of claim 1, as well as a digital memory arrangement, 417 and 419 in Figure 4, into which image

data of a 4:3 aspect ratio is clocked, see column 4 line 55 to column 5 line 27. The data is read from the memory at a rate which in the centre of the raster is faster than the first rate, see column 5 lines 28 to 42.

- 4.4 No other document has as many of the claimed features explicitly present as D14 and the Board takes the view that this document, rather than D1 or D12 as urged by the respondents, represents the correct starting point for a consideration of inventive step.
- 4.5 D14 does not display an image of lower aspect ratio without reducing the [width of the] raster, column 6 lines 48 to 51 stating that the raster width must be reduced if standard signals are to be displayed on a wide screen. Nor does it provide for the creation of a delay interval determined by memory means in each line period. These two features are related to the extent that displaying a standard image on a wide screen results in side borders, the memory means permitting the image to be positioned as desired relative to these borders.
- 4.6 The question to be answered is accordingly whether the skilled person, starting out from the disclosure of D14 and faced with convergence problems as a result of changes in scan width for differing aspect ratios, would be led to maintain the raster size and by means of a memory provide for picture positioning.
- 4.7 Two documents in the proceedings provide for the display of standard images on a wide screen without reducing the raster size, D1 and D12. It was argued by the appellant that neither constituted an enabling disclosure and that both were speculative proposals made before 5:3 picture tubes were even available. D1 was said not to be concerned with HDTV (high-definition

television) but with the use of wide-screen display tubes for a standard 4:3 image, the extra screen area then being taken up by smaller standard images, as in picture-in-picture or PIP (referred to hereinafter as "4:3+PIP"). It was also asserted that all images displayed in D1 are fixed in size and position. Thus, D1 is seen by the appellant as merely proposing an additional use for wide-screen display tubes, perhaps in the period before they were attractive to the consumer on the basis of wide-screen broadcasting. It was also pointed out by the appellant that the English-language translation of D1 suggests at page 5 that the area on which the smaller images are displayed can have a different shadow-mask pitch or even be monochromatic, whilst in another variant the screen is rotated through 90°, which would appear to be incompatible with the usual scanning direction of display tubes.

- 4.8 The Board finds this argument as applied to the main embodiment of D1 unconvincing. Although such exotic embodiments are indeed described in D1, they are alternatives suggested towards the end of the description. It does not appear plausible that the skilled person would interpret Figure 2 of D1, which shows the main embodiment, as proposing that an expensive 5:3 picture tube be used exclusively for 4:3 images. What is described in D1 is apparently an attempt to kick-start the mass-production of 5:3 picture tubes in order to make HDTV economically viable, see page 2 lines 11 to 18. D1 would therefore be understood by the skilled person as proposing an additional function of a wide-screen TV, in order to make it more attractive to consumers by providing two modes: as primary mode 5:3, and secondarily 4:3+PIP. The scanning width would seem to be the same for both modes; the Board can see no merit in the appellant's suggestion that the main image is scanned separately from the PIP images. This interpretation of the

direction in which the art was moving agrees with the disclosure of D12, published some 18 months after D1. D12 discloses 4:3+PIP in the context of an evolutionary approach to EDTV, in which 16:9 picture tubes are introduced into an environment still dominated by 4:3 images. The implication of D12 is that 4:3+PIP would give the consumer a motivation to buy a wide-screen TV in the transitional period when 4:3 is still in widespread use. Clearly this requires a receiver capable of displaying both formats. D12 indicates at page 727, left hand column, that wide-screen picture tubes were not yet commercially available, and in the centre column of the same page that frame stores for displaying 4:3 + PIP images were only just becoming available.

4.9 Thus, although the Board agrees with the appellant that the minimal technical disclosure of both D1 and D12 does not provide the teaching necessary for constructing a practical display, these documents do give the skilled person an incentive to maintain the same raster size for both EDTV and standard images in a system such as the D14 system, in that the additional, advantageous feature of 4:3+PIP can then be provided. It is noted that claim 1 does not exclude the display of 4:3+PIP. If the skilled man were to provide 4:3+PIP in accordance with D1 and D12 in the D14 system, the appellant's convergence problem would as a side-effect be solved, since on switching from 5:3 to 4:3 the presence of the PIP display would remove the need to reduce raster width.

4.10 The Board accordingly concludes that the skilled person, starting out from the D14 disclosure, would without the exercise of invention appreciate from D1 and D12 that in a dual standard receiver the raster could advantageously be maintained in size for 4:3 images in order to display 4:3 + PIP. The remaining

question to be answered is therefore whether the skilled person would effect this by making use of a delay determined by memory means and which controls the position of the image within the width of the raster.

- 4.11 The evidence at the Board's disposal suggests however that this is not the case. Neither D1 nor D12 contains any disclosure relevant to the positioning of the image. Although it may be implicit in D1 that some form of delay must be provided if the main image is to the right of the PIP images, there is no disclosure of a memory in D1 and hence no suggestion that position is determined by memory means. D12 only suggests positioning the main image on the left, in which case no delay is necessary. Although it was argued by the respondents that the claim covers the case of zero delay, this does not alter the fact that means for creating a delay interval are specified.
- 4.12 There are documents in the proceedings which refer to image positioning, in particular D8 and D10, (although D10 does so in the context of positioning the PIP images rather than the main image), but a juxtaposition of the disclosure of three documents - D14, and D1 or D12, and D8 or D10 - is then required to arrive at approximately what is claimed. It is observed that it has not been shown that D1 and D12 represented the common technical knowledge in the art at the claimed priority date and their combination with D14 is only permissible because they show the skilled person why it would be advantageous to maintain raster width for a 4:3 image. The same argument cannot be applied to the matter of image positioning.
- 4.13 The Board accordingly concludes that the skilled person, starting out from the disclosure of D14 and being aware of D1 or D12, would not arrive at the claimed arrangement without the exercise of invention.

4.14 The Board has also considered whether the skilled person, starting out from the disclosure of D1 or D12 rather than D14, would without the exercise of invention arrive at the claimed arrangement. As noted above, D1 has so little technical content that the skilled person could not be expected to make a serious attempt to implement it. The Board accordingly agrees with the appellant that D1 does not constitute an enabling disclosure. Moreover, even if the disclosure of D1 were to be taken seriously by the skilled person, and if the subject-matter of the claim preamble, together with the feature of signal processing means, is for the sake of argument considered to be implicit in D1, there is no suggestion of any delay for the main displayed image. Nor does D1 suggest that a memory with differing read/write rates should be used. Although as noted above the technical problems involved and the claimed means which solve them are known per se, it does not appear convincing to the Board that they could be solved in the context of D1 without the exercise of inventive skill. Respondent I points out that the skilled person implementing a receiver in accordance with D1 would appreciate the need to take measures to position the various images correctly on the screen, and that this implies the use of preset delays; it does not however imply the use of a memory. The addition of a variable read/write rate requires yet another step.

4.15 D12 bears considerable similarity to D1 but explicitly mentions the use of a frame store. It does not however suggest the use of a programmable delay interval to enable the image to be centred or - contrary to respondent I's assertion - of the use of differing read/write rates for the frame memory. The reference at page 727, centre column, to a "13.5MHz luminance sampling rate, but with a 4:1:1 Y,U,V format" seems as asserted by the appellant to correspond to an overall sampling rate of $[(4+1+1)*13.5]/4$, which is 20.25MHz.

It does not therefore appear to the Board that the skilled person would be led by the disclosure of this document to the claimed arrangement.

5. Since the subject-matter of claim 1 has been found to involve an inventive step it is not necessary to consider the subordinate claims or the claims of the various auxiliary requests.
6. It is noted that the description has not been amended. For this reason it is necessary to remit the case to the Opposition Division in order to bring the statement of invention into line with the revised claim 1 and to acknowledge documents D1 and D12.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to maintain the patent on the basis of the appellant's main request, having regard to the comments at point 6 above.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg