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D E C I S I O N
of 12 September 1995

Case Number: T 0569/94 - 3.5.1

Application Number: 87115458.9

Publication Number: 0283561

IPC: H04N 5/14

Language of the proceedings: En

Title of invention:
Video signal control apparatus

Patentee:
KABUSHIKI KAISHA TOSHIBA

Opponent:
Philips Patentverwaltung GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (no) "

Decisions cited:
T 0536/88

Catchword:
-



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Boards of Appeal

Chambres de recours

Case Number: T 0569/94 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 12 September 1995

Appellant: Philips Patentverwaltung GmbH
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office dated 11 May 1994
concerning maintenance of European patent
No. 0 283 561 in amended form.

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: A. S. Clelland
C. Holtz

Summary of Facts and Submissions

I. European patent No. 0 283 561 was granted on 4 March 1992 on the basis of European patent application No. 87 115 458.9, filed on 21 October 1987 and claiming a priority date of 17 March 1987.

II. An opposition was filed on 27 November 1992 on the ground that the subject-matter of the patent did not involve an inventive step (Article 100(a) EPC).

The Opponent (Appellant) referred inter alia to the prior art document:

D1: US-A-4 642 690, and
D2: EP-B-0 111 521.

III. On 6 May 1993 the patent Proprietor (Respondent) filed a reply to the opposition, requesting that the opposition be rejected. Furthermore, amended Claims 1 to 10 were filed as an auxiliary request.

IV. The Opposition Division, in a communication dated 12 November 1993, pointed out that D2 had not been published until after the claimed priority date and cited the published application corresponding to D2:

D5: WO-A-84/00091.

V. On 18 March 1994, more than a year after expiry of the opposition period, the Opponent introduced a number of new documents, including:

D7: US-A-3 604 844,
D9: US-A-4 197 557, and
D13: US-A-4 642 682.

In the description of the contested patent D13 is indicated as the closest prior art.

VI. By its decision of 11 May 1994 the Opposition Division maintained the patent in amended form according to the patent Proprietor's auxiliary request. It was held that the subject-matter of Claim 1 as amended involved an inventive step over the closest prior art, which was taken to be either D5 or D7.

VII. Claim 1 as amended reads (excluding the reference signs):

A video signal contrast control apparatus for controlling the status of a video image by varying DC and AC components of a video signal, characterized by comprising:

a video operation unit operable by a viewer for contrast control to output contrast control data of an AC component of the video signal,

control data storage means including a buffer memory for storing said control data;

data readout means for reading out said control data from said control data storage means during a vertical retrace period in which no image is output, said data readout means including a switch which is turned on during said vertical retrace period and is turned off during a vertical scanning period;

AC component control means for varying said AC component of said video signal during said vertical retrace period based on said control data read by said data readout means, said AC component control means including a register, a digital-to-analog converter for performing a digital-to-analog conversion of data latched in said register and a contrast controller which is supplied with an output of said digital-to-analog converter.

VIII. On 9 July 1994 the Opponent filed a notice of appeal against this decision. The appeal fee was paid on 12 July 1994. A statement setting out the grounds of appeal was subsequently filed on 16 September 1994. The grounds relied solely on D13.

IX. On 23 September 1994 the Appellant filed a letter containing further arguments. These were based on D9.

X. In a communication of the Board dated 13 July 1995 the Rapporteur discussed the issue of inventive step in relation to both D13, which the Appellant had cited in the grounds of appeal, and D5, considered in the decision of the Opposition Division. Oral proceedings were appointed.

XI. Oral Proceedings were held on 12 September 1995. The arguments of the Appellant can be summarized as follows:

D13 was concerned with contrast control in a device specially intended for - but not limited to - a telecine, i.e. an apparatus televising motion pictures. The purpose of the apparatus was to adjust individual colours of an image by means of a control panel. The correction data was said to be delivered during the vertical retrace interval. This must also apply to the other video parameters set by the control panel, in particular the gain of the luminance signal (contrast). Thus D13 described the main features of the invention.

D5 described a contrast control apparatus for varying the DC and AC components of a video signal. Explicitly or implicitly this document disclosed nearly all the features of Claim 1. In particular it taught that the AC component of the video signal should be varied only during a certain line period following the vertical retrace period, when no picture is output, irrespective

of the point in time when the viewer actually operated the contrast control. This timing must be regarded as equivalent to the one specified in Claim 1, since what mattered was only that the screen was blanked when the gain was set. Furthermore, it would have been obvious to replace the capacitor 34 in D5 - used to hold the voltage controlling the variable gain video amplifier during the scan - by a register and a DAC since these circuits were merely a digital equivalent. Digital contrast control as such was known from D1.

XII. The Respondent's (patent Proprietor's) arguments in support of the patentability of the subject-matter of Claim 1 can be summarised as follows.

D13 had little bearing on the present invention. Only six lines of the whole document (column 7, lines 45 to 50) actually concerned the setting of the contrast. It was not stated that the gain of the video signal should be varied during the vertical retrace signal, merely the colour correction being performed at that time. The problem underlying the invention, the suppression of brightness variations caused by changes in the contrast setting, was not discussed in D13, nor was it evident from the described embodiments.

Although D5 mentioned a contrast control signal, this document was mainly concerned with an automatic grey level setting. It did not disclose all the circuits specified in Claim 1, such as the buffer memory for storing the control data before the data was applied to the video signal. Any suggestions that the missing means would be implicit in D5 or obvious from it must be regarded as mere speculation.

XIII. The Appellant requests that the decision under appeal be set aside and the patent revoked.

The Respondent requests that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.
2. *Admissibility of documents*
 - 2.1 In a submission received on 23 September 1994, i.e. subsequent to filing of the Statement of Grounds and after expiry of the appeal period, reference was made to document D9. This document was as noted at point V above cited during the opposition but after expiry of the nine-month opposition period; the Opposition Division held it to be of insufficient relevance to justify its late admission to the proceedings.
 - 2.2 The Board agrees with this finding. D9 is concerned with contrast and brightness control in which black level clamping is effected with respect to the back porch of the waveform during each horizontal blanking interval. Few of the features of the characterising part of Claim 1 can be found in this document. It is noted that the DC component is varied during a horizontal retrace period rather than an AC component during a vertical retrace period as implied by claim 1 of the patent, so that in the Board's view the document is of insufficient relevance to justify its admittance to the present proceedings.

2.3 The document on which the Appellant relies in the Statement of Grounds is D13. This document is acknowledged in the patent as published and was introduced into the opposition proceedings, but also after expiry of the nine-month opposition period, by the present Appellant. It appears from the minutes of the oral proceedings that the Opposition Division refused to admit the document. However, following T 536/88 (OJ EPO 1992, 638), "A document indicated in the European patent as the closest or important prior art for the purposes of elucidating the technical problem set out in the description nevertheless forms part of the opposition or opposition appeal proceedings even if not expressly cited within the opposition period". The Board accordingly admits D13 to the present proceedings.

3. *Novelty and inventive step*

3.1 The patent is concerned with a problem which arises in contrast control, in effect gain control, of a video signal. An undesired side effect of any change in the gain is a variation in the DC level of the signal. If, as is commonly the case, the DC level has a substantial time constant, any change in contrast will cause a slow and undesirable change in picture brightness. The patent overcomes this problem by arranging for changes in contrast to take place only during the vertical retrace or fly back interval. To this end the contrast signal, which is digitised, is initially stored in a buffer memory and during the aforementioned vertical retrace interval a switch is actuated to pass the signal to a register, where it is stored and supplied by way of D/A converter to a contrast controller until the next vertical retrace period. As described and claimed the video signal itself is analog but the control circuitry is largely digital.

3.2 D13 is the document primarily relied upon by the Appellant. It discloses apparatus in which it is possible to adjust various video parameters, including both DC and AC components of a video signal, on a frame-by-frame basis using digital control techniques. Although D13 is primarily concerned with telecine apparatus, reference is made at column 5 lines 42 to 46 to use of the apparatus in "a video tape recorder or other video image device"; it therefore appears that the teaching of D13 is applicable to video signal control apparatus as in Claim 1.

3.3 Referring to Figures 1A and B of D13, the known apparatus comprises a video control panel 45 by means of which a substantial number of parameters of a video signal, particularly colour parameters, can be controlled. Among these are contrast ("GAIN") and brightness ("LUM"). The control panel accordingly constitutes a video operation unit operable by a viewer for contrast control to output contrast control data of an AC component of the video signal. Control data is stored in a buffer memory 59, i.e. "control data storage means". By means of a computer 50, see column 7 lines 23 to 63, data is read out from the memory 59; the point in the video cycle of which this data is read out will be discussed further below. The data derived from control panel 45 is supplied by way of a bus 51 to two separate paths, colour data, which apparently includes the brightness of individual colours (see the lower part of control panel 45) being supplied to video signal controller 10 shown in greater detail in Figure 2, whilst non-colour data is supplied to D/A converters 55 and thence by way of multiple cables 56 and 32a to 32d to correction circuits 31a to 31d; these latter components can be said to constitute AC component control means for varying the AC component of the video

signal based on data read by the computer 50. The circuit 31d can be considered a contrast controller in the same sense as Claim 1.

- 3.4 Certain features of Claim 1 are not disclosed in D13: that the control data for contrast control is read out during a vertical retrace period in which no image is output, using a switch which is turned on during this period and turned off during scanning; that contrast control takes place during the vertical retrace period; and that the D/A converter receives its data from a register.
- 3.5 The essential question to be answered is in the Board's view whether the skilled person would derive from D13 that data for contrast control is read out and applied during the vertical retrace period; the other features of Claim 1, such as the switch and the register, appear to the Board to be matters of ordinary practice, so that if the Board decides the above question in the affirmative, the subject-matter of Claim 1 cannot be saved by the remaining features.
- 3.6 In answering this question the Board has noted that although video signal controller 10 and its operation to control colour data are described in detail, no description is given of the manner in which the data relating to the DC control levels is processed. The description makes the general statement at column 6 lines 11 to 14 that "the vertical retrace interval signal, which occurs once per video field, is used to signal the control computer to update stored correction values, described later.". It is noted that a vertical retrace signal is supplied from internal sync generator 38 by line 49; this line 49 passes through the D/A converters 55 and is connected on the one hand to computer 50 and on the other to control knob interface

52. There is no discussion in D13 of any interrelationship between the vertical retrace signal and the D/A converters; nor is the relationship of this signal to the control knob interface 52 discussed.

3.7 At column 7 lines 55 to 62 it is stated that data from memory 59 "is provided to the phase responsive circuit 10 at periodic intervals (as disclosed herein, during the vertical retrace interval) so that different colour corrections can be made for different scenes". It is not stated in the text that similar data is stored for, for example, contrast. At column 24 lines 1 to 4 it is said that any other video parameter over which control is desired **as a function of instantaneous hue** can also be controlled, for example, gain ... by employing the techniques disclosed herein". In the Board's view this passage is to be interpreted in the light of the matter in bold type; in other words, control is only being discussed insofar as it relates to colour.

3.8 The teaching of D13 as regards the manner in which gain is controlled is thus somewhat unclear. On balance the Board concludes that the skilled person would understand D13 to teach at most that the DC control level data, including the contrast, is **read in** by the computer from the control panel during the vertical retrace period, but not that the DC control signals are necessarily **read out** to the gain circuits during this period. It is this latter feature which gives rise to the advantage of avoiding visible brightness changes.

3.9 Accordingly, in the Board's view, the disclosure of D13 would not lead the skilled person to the subject-matter of Claim 1.

3.10 Turning now to D5, this document was cited in the opposition proceedings but was held by the Opposition

Division not to impugn the novelty or inventive step of Claim 1. The Board however reaches a different conclusion. D5 discloses, inter alia, video signal contrast control apparatus for controlling the status of a video image by varying the DC and AC components of a video signal, the apparatus including a contrast control, shown as input terminal 46, which from page 2 lines 16 to 19 is implicitly operable by a viewer. It is clear that the control data is permanently available at terminal 46, implying some form of storage means, even if only a manually adjustable potentiometer. Control data is read out during a vertical blanking interval in which no image is output, the two consecutive horizontal scans immediately following vertical retrace in the preferred embodiment. The data is read out by means including a switch 14a, b, c which is connected only to receive control data during the vertical blanking period. A feedback loop including a variable gain amplifier 16, video amplifier 18, comparator 22 and buffer amplifier 26 serve to vary the gain of the video signal during the vertical blanking period. based on data read when the switch is connected. The data is supplied to the variable gain amplifier 16, which is the contrast controller, by way of a capacitor 34 and the buffer amplifier 26, which serve as storage means.

- 3.11 In D5 a brightness level demodulator is provided at the input of the D5 circuit to vary the brightness signal in inverse proportion to contrast, so that any change in contrast does not provoke a change in brightness. This circuit compensates the video signal for shifts in DC level caused by contrast changes, but it cannot compensate for instantaneous changes within the control loop caused by a change in the gain of the variable gain amplifier.

3.12 The invention as claimed in Claim 1 differs from the disclosure of D5 in the following respects:

(a) the controlling mechanism is digital whereas that of D5 is wholly analog; thus, in accordance with claim 1 the contrast control signal is stored in what is implicitly a digital buffer memory before processing and the controller data is held in a register prior to D/A conversion, the converted analog signal being supplied to the contrast controller.

(b) control data is read out and applied during the vertical **retrace** period rather than the more general vertical blanking period.

3.13 However, in the Board's view it was at the claimed priority date obvious to substitute an analog control system by its digital equivalent, the basic control mechanism remaining unaltered by the substitution; D1, cited in the course of the proceedings, shows such a controller, and the Board considers that no invention would be involved for the skilled person to implement the control functions in the controller of D5 using digital as opposed to analog circuitry. The skilled person would thus have found it obvious to modify D5 to provide feature (a).

3.14 As regards the time at which the data is read out and applied, feature (b), the Board is unable to see any real technical distinction between reading the data out during the retrace period as in the patent or during the blanking period as in D5. In each case the object is to avoid reading data out during active screen lines; the

retrace period can be viewed as a subset of the blanking period and no convincing reason was given by the Respondent's representative as to any advantage arising from using specifically the retrace period. The Board notes that there has been an increasing tendency in recent years to make use of the blanking period for data transmission, such a use - the well-known videotext system - having been common general knowledge well before the claimed priority date. There are therefore sound technical reasons why the skilled person would use the actual retrace period, when no information can be sent, rather than any other part of the blanking period. Accordingly, in the Board's view, the subject-matter of Claim 1 lacks inventive step having regard to the disclosure of D5.

4. Since Claim 1 has been found not to be allowable and no further requests have been made by the Respondent, it has not been necessary to consider subordinate Claims 2 to 6.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is revoked.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg