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# D E C I S I O N
## of 1 December 1995

**Case Number:** T 0050/94 - 3.5.1

**Application Number:** 84306647.3

**Publication Number:** 0138482

**IPC:** H04N 9/76

**Language of the proceedings:** EN

**Title of invention:**
Video signal superimposing device

**Patentee:**
SHARP KABUSHIKI KAISHA

**Opponent:**
GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig holländ. Stiftung & Co. KG

**Headword:**
-

**Relevant legal provisions:**
EPC Art. 100(a), 56

**Keyword:**
"Inventive step (yes)"

**Decisions cited:**
-

**Catchword:**
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

**Case Number:** T 0050/94 - 3.5.1

# D E C I S I O N
## of the Technical Board of Appeal 3.5.1
## of 1 December 1995

**Appellant:** (Opponent)
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**Decision under appeal:**
**Interlocutory decision of the Opposition Division of the European Patent Office dated 2 December 1993 concerning maintenance of European patent No. 0 138 482 in amended form.**

**Composition of the Board:**

**Chairman:** P. K. J. van den Berg
**Members:** R. Randes
G. Davies

## Summary of Facts and Submissions

I. European patent No. 0 138 482 was granted on 5 June 1991 on the basis of European patent application No. 84 306 647.3, filed on 28 September 1984 and claiming priority from Japanese application No. 185755/83 dated 3 October 1983.

II. Opposition was filed on 26 February 1992, requesting revocation of the patent in its entirety on the basis that the subject-matter of the claims as granted lacked an inventive step (Articles 100(a), 52(1) and 56 EPC).

During the course of opposition proceedings the following documents, inter alia, were cited:-

D1: US-A-3 296 367;

D2: Neue Einschübe zum Prüfzeilen-Signalgenerator SPZF, Neues von Rhode & Schwarz 72, January 1976, pages 14 to 18;

D3: R. THEILE: "Fernsehtechnik, Band 1 - Grundlagen", Springer-Verlag, Berlin, 1973, pages 100 to 111.

III. Oral proceedings were held before the Opposition Division on 4 August 1993. At the end of these proceedings the Division announced its intention to maintain the patent on the basis of claims originally submitted on 13 October 1992. After the Proprietor had submitted amendments to the description, a written interlocutory decision was issued on 2 December 1993.

IV. The documents constituting the patent as maintained are as follows:

Claims 1 and 2 received on 13 October 1992 and 3 to 8 as in the published patent specification;

Description column 9, lines 1 to 10 as in the published patent specification, and amended columns 1 to 8 with insertion pages 1 to 3 as received on 9 September 1993;

Drawing sheets 1 to 4 as in the published patent specification.

The independent claims of the patent as maintained read as follows:

"1. A video signal superimposing device for superimposing and displaying video signals produced from at least two systems comprising:
input means (1) for inputting a colour complex video signal ((a));
separation means (7) for separating the complex video signal into a first brightness signal ((c)) and a first chroma signal ((d));
input means (4a, 4b, 4c) for inputting a second video signal;
first mixer means (8) for mixing a second brightness signal ((e)) derived from said second video signal and the first brightness signal separated by the separation means;
second mixer means (9) for mixing a second chroma signal ((f)) derived from said second video signal and the first chroma signal separated by the separation means; and
third mixer means (10) for mixing the mixed brightness signal ((g)) applied from the first mixer means (8) and

the mixed chroma signal ((h)) applied from the second mixer means (9), **characterised by:**
said second video signal comprising R, G, B signals;
first generation means (5) for generating said second brightness signal ((e)) based on the R, G, B signals;
second generation means (6) for generating said second chroma signal ((f)) based on the R, G, B signals;
means for producing a burst signal ((b)) from said colour complex video signal; and
colour subcarrier generation means (3) operable to use said burst signal to produce a colour subcarrier signal in synchronisation with the colour subcarrier signal of the first chroma signal for use in generation of said second chroma signal.

2. A video signal superimposing device for superimposing and displaying video signals produced from at least two systems comprising:
input means (1) for inputting a colour complex video signal ((a'));
separation means (7) for separating a first brightness signal component ((c')) and a first chroma signal component ((d')) from the colour complex video signal;
input means (4a, 4b, 4c) for inputting a second video signal;
first mixer means (8) for mixing a second brightness signal ((e')) derived from said second video signal and the first brightness signal separated by the separation means;
means (12, 13, 14) for producing a second chroma signal ((g')) representing a combination of the colour components of the colour complex video signal and the second video signal; and
third mixer means (10) for mixing the mixed brightness signal ((f')) and the second chroma signal,
**characterised by:**

said second video signal comprising R, G, B signals;
first generation means (5) for generating said second brightness signal ((e')) based on the R, G, B signals;
said means for producing a second chroma signal comprising:
demodulation means (12) for demodulating the first chroma signal ((d')) separated by the separation means (7) so as to form second R, G, B signals;
second mixer means (13) for mixing the inputted R, G, B signals with the second R, G, B signals produced from the demodulation means, respectively; and
third generation means (14) for generating said second chroma signal ((g')) based on the mixed R, G, B signals; and in that:
the video signal superimposing device further comprises:
means for producing a burst signal ((b')) from said colour complex video signal; and
colour subcarrier generation means (3) operable to use said burst signal to produce a colour subcarrier signal in synchronisation with the colour subcarrier of the first chroma signal for use in generation of said second chroma signal."

V. On 21 January 1994 the Opponent filed a notice of appeal and paid the prescribed appeal fee. A statement setting out the grounds of appeal was subsequently filed on 16 March 1994. With this statement the Appellant filed two further documents:

D4: H.GESCHWINDE: "Einführung in die PLL-Technik", Vieweg-Verlag, Braunschweig, 1978, pages 1 to 3;

D5: DE-A-2 616 593.

Oral proceedings, conditionally requested by both parties, were held on 1 December 1995.

VI. In advance of the oral proceedings the Respondent submitted on 24 October 1995 an auxiliary request, in which the independent claims were amended to specify that the colour complex video signal ((a), (a')) is from a video imaging system and that the second video signal comprising R, G, B signals is from a personal computer system. During the oral proceedings it was further requested that the patentability of the independent claims should, if necessary, be considered separately by the Board. The Respondent's main request however remained that the appeal be dismissed and the patent maintained in the form approved by the Opposition Division.

The Appellant maintained his request for the revocation of the patent in its entirety.

VII. The parties argued essentially as follows.

1. The Appellant (Opponent)

Document D1 showed, in the passage from column 1, line 63 to column 2, line 17, that a possible way of combining two NTSC video signals was to separate the luminance and chrominance signals, to bring the chrominance subcarriers into phase, to create weighted sums of the luminance and chrominance signals respectively, and to recombine them. While D1 said that this was difficult, the skilled person would recognise, in the light of the age of this document (published in 1967) and his subsequent knowledge of phase-locked loop techniques, that this statement no longer applied. In response to doubts expressed by the Rapporteur in the communication accompanying the invitation to oral proceedings whether this passage actually showed the separation of luminance and chrominance signals, the Appellant

asserted that it would be clear to the skilled person that nothing else could be meant. In particular attention was drawn to the phrase "it is possible to effect the weighted sum of the two complex signals to obtain a 'sum' sub-carrier" (column 2, lines 8 to 10). It was argued that the complex signals referred to were thus clearly only the chrominance components of the video signals to be combined.

The only additional problem faced by the skilled person in seeking to combine RGB signals from a personal computer with a colour complex video signal was that the two signals were of different formats. It was immediately obvious that the two signals had to be brought to a common format in order to combine them. Further the skilled person would be familiar, as a matter of common knowledge (illustrated by D3), with the techniques for converting an RGB signal into a colour complex video signal and vice versa. In particular, the process of breaking down a colour complex video signal into an RGB signal, which took place in every television receiver, involved locally regenerating the colour subcarrier in frequency and phase using the received burst signal, in order to extract the chrominance signals. Hence considering D1 and this common knowledge it would be obvious to build up the RGB signals into luminance and chrominance signals modulated with a colour subcarrier regenerated from the burst signal of the incoming colour complex video signal and combine them with the corresponding components of the incoming colour complex video signal, thus arriving at the subject-matter of claim 1.

The subject-matter of claim 2 reflected only an equally obvious decision to combine the signals in the RGB format. In this case it was not in fact necessary to make sure that the created colour subcarrier was in phase with the original incoming subcarrier. That the device of claim 2 used a subcarrier derived from the incoming burst signal was merely a matter of convenience, since, as mentioned before, such a subcarrier had to be regenerated in order to break down the incoming signal anyway. This feature therefore did not overcome any special problem and could not be considered to make the claimed subject-matter inventive. In particular, the Appellant disputed the validity of the alleged advantages of this feature put forward by the Respondent during the oral proceedings.

In response to arguments that the teaching of D1 as a whole led rather to different ways of combining signals, it was argued that the parts of D1 referring to SECAM signals were irrelevant, and that only the part of D1 from the beginning to column 2, line 17 should be taken into consideration.

In the statement of grounds of the appeal reference was made to document D2 as showing the construction of a colour subcarrier for synthesised signals in phase with the colour subcarrier of an incoming colour complex video signal. However, this document was not touched upon in the oral proceedings.

The arguments made were considered to apply equally to the main and auxiliary requests.

2. The Respondent (Proprietor)

The cited passage of D1 did not, as asserted by the Appellant, teach the decomposition of signals into separate luminance and chrominance signals for combination. Instead it was concerned with the theoretical, and even now difficult, possibility of directly taking weighted sums of two colour complex video signals. It was held that the "complex signals" referred to in line 9 of column 2 (cited by the Appellant) were in fact the same as the "complex video signal" mentioned in column 1, line 63, i.e. what was called in the patent claims the "colour complex video signal". Thus the passage of D1 relied upon by the Appellant did not teach any decomposition of the signals to be combined. On the other hand the rest of D1 taught that it was essential to demodulate the chrominance component of the signals before combining them, which was done at the colour difference level. Signals in D1 were therefore combined in an entirely different way to that put forward in the two embodiments of the invention, and there was no obvious way for the skilled person to arrive at the claimed material starting from this document.

Neither D1 nor any other document in the proceedings dealt with the problem of combining RGB signals with an existing colour complex video signal. While this might now be a commonplace problem, the age of the patent (priority 1983) should be borne in mind.

In the communication accompanying the invitation to oral proceedings the Rapporteur had raised doubts, in relation to the second independent claim, whether the use of the burst signal from the incoming video signal to create the colour subcarrier for the

synthesised signal was necessary. The Respondent put forward a number of alleged advantages of this feature, while admitting that none of them were disclosed in the patent specification.

## Reasons for the Decision

1. The appeal is admissible.

2. *The late-filed documents*

The newly submitted document D4 was intended by the Appellant to support the assertion that phase-locked loop techniques were well known to the skilled person at the priority date of the contested patent. This assertion is in fact not doubted by the Board, nor is it currently contested by the Respondent. Hence it is unnecessary to consider D4 in detail.

As to the new document D5, it does apparently show at least that mixing two phase-matched FBAS (e.g. NTSC or PAL) signals was known (page 2, lines 8 to 10). However, there is no discussion in this document as to how matching phases might be achieved. Further the method of mixing discussed therein does not appear to have any direct relevance to the contested patent. The proposal to break the FBAS signals down into luminance and chrominance constituents relates specifically to a problem arising from mixing two FBAS signals. There is no indication that the same approach should be taken when mixing RGB with FBAS signals.

It is to be noted that in the submission received 6 February 1995 the Appellant stated the opinion that the admission of D5 into the proceedings was unnecessary

to an assessment of inventive step. Further the Appellant did not pursue any arguments using D5 in the oral proceedings. In the light of these facts and the considerations above, the Board takes the view that it is unnecessary to consider this document further.

3. *Inventive step*

The only reason for revocation of the patent put forward by the Appellant is an alleged lack of inventive step in the subject-matter of the independent claims. This is therefore the only issue to be decided.

3.1 The main request

How to convert a colour complex video signal including a burst signal into RGB and vice versa would indeed appear to be part of the common knowledge of the person skilled in the art, as asserted by the Appellant. These processes are required to convert the output of a video camera into a PAL or NTSC broadcast signal and to convert a corresponding received broadcast signal into a television picture. It is shown in D3 that converting the complex signal into RGB involves regenerating a signal identical in wavelength and phase to the incoming colour subcarrier from the received burst signal. Indeed it is common knowledge that this is the purpose of the burst signal. Further it is accepted by the Board and not disputed by the Respondent that this would be accomplished by using phase-locked loop techniques well known to the skilled person at the priority date of the patent.

Therefore it would appear that the technical means for carrying out the currently claimed invention lay to hand for the person skilled in the art. However, this in itself is not sufficient to establish the lack of an

inventive step in the claimed material. It still remains to be determined whether the skilled person would be led by any available teaching to combine RGB and a colour complex video signal (including a burst signal) in either of the ways specified in the independent claims.

The Board considers document D1 to be irrelevant. Its main teaching relates to the SECAM system of colour television, and despite the fact that NTSC is mentioned, there is no indication how the ideas put forward in this document should be adapted to systems having a burst signal (e.g. NTSC and PAL). The passage relating to the combination of NTSC signals appears merely to be put forward as a theoretical possibility, to be immediately dismissed as impractical. Further, the Board shares the opinion of the Respondent that the "proposal" put forward there is to take a weighted sum of the full colour complex video signals, i.e. baseband luminance and modulated chrominance signals together. The Board agrees with the Respondent that the "complex signals" referred to in line 9 of column 2 are the complete colour complex video signals. The phrase pointed to by the Appellant ("to effect the weighted sum of the two complex signals to obtain a 'sum' sub-carrier") is taken to mean that the overall sum signal would include a suitable sum subcarrier, just as it would also include a luminance component. At any rate there is certainly no clear teaching of a method of combination in which the luminance and modulated chrominance signals are separated and then separately combined. While the problem of matching phases is mentioned, neither is there any indication of how to match phases of the chrominance signals in two unsynchronised video signals.

The Appellant has explicitly excluded those parts of D1 dealing specifically with SECAM from his arguments, but the Board notes anyway that the method of mixing put forward in the later part of D1, if adapted to NTSC, would not apparently lead in any obvious way to either of the embodiments claimed in the contested patent.

As to D2, this document does show the construction of synthetic signals where the colour subcarrier has a fixed phase relationship with that of an incoming colour complex video signal. However, D2 is, in this respect, concerned with the construction of test lines which are inserted in the vertical blanking period of an image. Hence it does not address the problem of mixing signals within lines, as does the contested patent. Further, the test lines are mixed into the incoming colour complex video signal in an "FBAS-Mischer", implying that the test lines are in the form of complete FBAS signals before mixing takes place. Thus while D2 tends to confirm the view already taken that the means for carrying out the invention were available to the skilled person, this document does not appear in fact to be any more relevant than the undisputed common knowledge already discussed.

While the means for carrying out the invention would therefore have been familiar to the skilled person, the Appellant has not pointed to any prior art at all discussing how RGB signals might be mixed with a colour complex video signal in the sense of mixing signals within lines of the image. Neither has a convincing case been made as to why the skilled person would be led to do so in the ways specified in the two independent claims. More specifically there has been no teaching put forward which would have apparently led the skilled person on the one hand to split the incoming video signal into luminance and modulated chrominance signals,

and on the other to build the RGB signals up to this level (using the burst signal from the incoming video signal) before mixing them and then carrying out the final superimposition of luminance and chrominance signals to create the output colour complex video signal, as specified in claim 1. Nor does any available document point to reducing the incoming video signal to luminance and baseband RGB components (in itself apparently an unusual combination), creating a luminance signal from the second, RGB, source, and combining the components at this level before building up the output colour complex video signal, as specified in claim 2.

Hence the Board considers that the Appellant has not made a convincing case that the skilled person could arrive at the subject-matter of either of the independent claims without the exercise of inventiveness. In opposition the initial burden of proof lies with the Opponent, and the Board considers that in the current proceedings this burden has not been discharged. It must be concluded that it has not been established that the subject-matter of the independent claims of the main request fails to satisfy the requirement of the EPC for an inventive step.

3.2 The auxiliary request

In the light of the above it is unnecessary to discuss the auxiliary request.

**Order**

**For these reasons it is decided that:**

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl P. K. J. van den Berg