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**D E C I S I O N**  
**of 31 May 1996**

**Case Number:** T 0488/91 - 3.5.1

**Application Number:** 82903018.8

**Publication Number:** 0091445

**IPC:** H04N 5/04

**Language of the proceedings:** EN

**Title of invention:**

Vertical sync counter with automatic recognition of TV line standard

**Patentee:**

MOTOROLA, INC.

**Opponent:**

Philips Electronics N.V.  
Interessengemeinschaft für Rundfunkschutzrechte E.V.

**Headword:**

MOTOROLA/Vertical sync counter for TV line standards

**Relevant legal provisions:**

EPC Art. 56, 107

**Keyword:**

"Binding effect of appeal/non appealing party may not challenge the patent as maintained in amended form"  
"Patentee's main request going beyond the patent as maintained in amended form by the Opposition Division inadmissible"  
"Inventive step (yes)"

**Decisions cited:**

G 0004/93, G 0009/92

**Catchword:**

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**Case Number:** T 0488/91 - 3.5.1

**D E C I S I O N**  
**of the Technical Board of Appeal 3.5.1**  
**of 31 May 1996**

**Appellant:** Interessengemeinschaft  
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**Decision under appeal:** Interlocutory decision of the Opposition Division  
of the European Patent Office dated 26 April 1991

concerning maintenance of European patent  
No. 0 091 445 in amended form.

**Composition of the Board:**

**Chairman:** P. K. J. van den Berg

**Members:** R. Randes

W. M. Schar

## Summary of Facts and Submissions

I. European patent No. 0 091 445 was granted on 18 January 1989 on the basis of European application No. 82 903 018.8, filed on 17 September 1982.

II. An opposition was filed against the European patent requesting it be revoked on the grounds of Article 100(a) EPC, in particular because of lack of inventive step, mainly with regard to the following prior art documents:

D2: US-A-4 228 461 and

D4: DE-A-2 928 265.

III. By an interlocutory decision allowing separate appeal within the meaning of Article 106(3) EPC, sent out on 26 April 1991, the Opposition Division decided to maintain the European patent in amended form according to the Respondent's auxiliary request. The independent claims of the auxiliary request, as well as the independent claims of the main request had been amended and restricted in relation to the independent claims as granted. The independent claims of the auxiliary request contained additional features in relation to the independent claims of the main request. The independent Claim 1, maintained as amended reads as follows:

(a) A vertical counter (34) for a TV receiver having a horizontal oscillator (28) for providing horizontal sync pulses which are coupled to at least said counter to be counted thereby;

- (b) said counter being adapted to provide output pulses to a vertical sweep generator (36),
- (c) said counter being adapted to receive a vertical sync pulse,
- (e) said sync pulse occurring in at least one of two frequencies, with respect to said horizontal sync pulses, at any given moment,
- (f) wherein said vertical counter is characterised by having at least a first mode of operation wherein said counter counts to a first predetermined number of said horizontal pulses corresponding to reception of a first standard of signal having vertical sync pulses at a first frequency, after which said vertical counter is reset,
- (g) and having at least a second mode of operation wherein said counter counts to a second predetermined number of said horizontal pulses **corresponding to a reception of a second standard of signal having vertical sync pulse** [sic should apparently be "pulses"] **at a second frequency**, after which said vertical counter is reset,
- (h) said vertical counter comprising means responsive to said horizontal pulses and to said vertical sync pulses for providing a change signal indicative of a change from reception at one **standard** frequency to reception at a different **standard** frequency, said vertical counter changing automatically between said first and second modes of operation in response to said change signal and

- (k) wherein when said counter begins operating in either mode of operation said counter is reset automatically by said vertical sync pulse for a predetermined number of counter cycles whereupon said counter is thereafter reset by the count contained within said counter corresponding to the predetermined number of horizontal pulses associated with the particular mode of operation.

The labelling of the features with letters has been made by the Board in accordance with the identification made by the Opposition Division when reading Claim 1 onto document D2. The parts of features (g) and (h), emphasised by the Board, in the following identified as sub-features (i) and (j) respectively could not be read onto D2 by the Opposition Division. Also feature (k) was not found in D2.

The independent Claim 3 is identical to Claim 1 in that it includes all the features (a) to (h), but instead of the last feature (k) it contains as the last feature, feature (l), which reads:

- (l) further comprising lock-out means for inhibiting comparison of the counter count corresponding to said first predetermined number with the receipt of said vertical sync pulse when said counter is operating in said second mode of operation.

Also this feature was according to the Opposition Division not present in D2.

The Opposition Division considered the teaching of D2 to be the closest prior art, containing most of the

features of the independent claims. Claim 1 was, however, clearly distinguished from the arrangement disclosed in D2 by feature (k) and Claim 3 by feature (l). Moreover both independent Claims were distinguished from the arrangement of D2 by the sub-features (i) and (j) derived from the features (g) and (h) respectively. The opposition Division interpreted D2 as meaning that the arrangement therein disclosed could also be changed from reception at one frequency to reception at a different frequency, but that the independent claims of the patent were distinguished therefrom by

- (i) the vertical sync pulses at the second frequency belong to a second standard signal and
- (j) the second predetermined number of the horizontal pulses corresponds to the reception of a vertical sync pulse at a second frequency.

According to the Opposition Division the problem to be solved by the invention was the automatic recognition of different TV line standards by a vertical sync counter and furthermore the automatic adjustment of the counter to one of the two different standards.

According to the Opposition Division both Claims 1 and 3 solved the problem and the subject-matter of the independent claims was not obvious having regard to the teaching of D2.

Moreover, having regard to the submission of one of the opponents (OII), that the subject-matter of Claim 1 lacked an inventive step with regard to the disclosure

of D2 and D4 because the features (i), (j) and (k) were known from D4 and that the skilled person could combine them with the features known from D2 and thereby obtain as a result the subject-matter of Claim 1, the Opposition Division expressed the following view:

"This argument cannot be accepted because D4 relates to an analog circuit which synchronizes a sawtooth generator either to a received standard (50 Hz or 60 Hz) sync pulse or approximately maintains the sawtooth frequency when no vertical sync signal is received in order to avoid a fast rolling picture (see pages 4 and 5). This situation is completely different to the one which underlies the problem to be solved by the apparatus of the claims. The apparatus of the claim requires in both modes of operation a received standard vertical sync. The skilled person would therefore have no reason to consider the teaching of D4."

IV. On 24 June 1991, the Appellant (Opponent II) filed an appeal against the decision, paying the appropriate fee simultaneously. The statement of grounds of appeal was filed on 16 August 1991.

The Appellant contested the argumentation of the Opposition Division in the decision under appeal and based his objection of lack of inventive step on the teaching of the documents which had also been the two main documents at issue in the opposition proceedings, as identified under foregoing point II.

V. After the Respondent in a letter, dated 3 March 1992, had replied to the Appellant's statements in the grounds of appeal, the Board, in a communication

pursuant to Article 11(2) of RPBA, issued on 15 April 1992, expressed the opinion that document D2 was not so relevant as suggested by the Opposition Division and could hardly be considered as a starting point for an arrangement for reception of different standard frequency signals and thus, furthermore, neither the teaching of D4 alone, nor in combination with that of D2 would lead the skilled person to the invention.

- VI. Oral proceedings were held on 15 July 1992, at which one of the parties to the appeal proceedings as of right (Opponent I), although duly summoned, did not appear.

The Appellant in his argumentation now almost entirely relied on the teaching of document D4, over the teaching of which he considered the invention according to the present independent claims to be obvious or self-evident, since the skilled person had only to translate the analog technique used according to D4 into a modern digital form.

For a skilled person it was self-evident that a sawtooth wave in an analog circuit could represent a counter in a digital application. It was, therefore, also self-evident that the skilled person, when starting from the teaching of D4, would easily arrive at the claimed invention. According to D4 the vertical synchronisation was performed with the aid of such a sawtooth wave. According to D4, as well as according to the claimed invention, an object was to provide vertical sync pulses free from noise.

It was quite clear to a skilled person that when using a counter and counting a line standard (e.g. 525 lines) it was necessary to reset the counter when the desired count was reached. This was also done according to the teaching of D4, either automatically by the swinging effect of the capacitor used or by a sync signal "resetting" the sawtooth (D4, e.g. page 8, lines 16 to 22). Also, according to the teaching of D4 it was disclosed that two different line standards could be counted. Moreover, the different line standards were according to D4 recognised by a sync signal detector (5) and e.g. the 50 Hz-signal was not identified until it had been detected that a certain level of the sawtooth amplitude had been exceeded several times (D4, page 10, second paragraph), thus, in a way corresponding to the claimed invention.

The Appellant also pointed out that the independent Claims 1 and 3 were much broader in their scopes than the embodiments disclosed in the description. Thus, the expression "means responsive to said horizontal pulses and to said vertical sync pulses for providing a change signal...", was far too vague and did not identify the solution of the invention, rather it could be considered to be a statement of the problem.

VII. The Respondent contested the arguments of the Appellant. He considered the claims perfectly clear and in no way obvious having regard to the art disclosed in the cited references D2 and D4.

VIII. The Appellant requested at the end of the oral proceedings that the decision under appeal **be set aside** and that **the European patent be revoked**.

The Respondent requested that the **appeal be dismissed** and

1. according to his main request that the patent be maintained on the basis of the **former main request** filed with and refused by the Opposition Division and
2. according to his auxiliary request **on the basis of the form as maintained** by the Opposition Division.

IX. After deliberation by the Board the Chairman gave the following decision:

The proceedings will be continued in writing.

X. Having regard to the fact that the Respondent first requested the dismissal of the appeal and the maintenance of the patent according to the contested decision, whereas during oral proceedings this request became an auxiliary request, following a broader main request to maintain the patent in accordance with the main request as rejected by the Opposition Division, the Board in an interlocutory decision of 15 November 1992, referred to the Enlarged Board of Appeal the following two-fold question concerning an important point of law:

A: Is the Board of Appeal allowed to modify a contested decision to the detriment of the Appellant;

B: if yes, to what extent?

XI. In its decision of 14 July 1994, G 4/93, and also in G 9/92 (OJ EPO 1994, 875) which dealt with the same point of law, the Enlarged Board of Appeal answered these questions in the case of an opponent as the sole appellant in the following way:

If the opponent is the sole appellant against an interlocutory decision maintaining a patent in amended form, the patent proprietor is primarily restricted during appeal proceedings to defending the patent in the form in which it was maintained by the Opposition Division in its interlocutory decision. Amendments proposed by the patent proprietor as a party to the proceedings as of right under Article 107, second sentence, EPC, may be rejected as inadmissible by the Board of Appeal if they are neither appropriate nor necessary.

XII. In a further communication, dated 11 January 1995, the Board having regard to said decision of the Enlarged Board of Appeal interpreted said decision in the way that a Respondent - who had not challenged the appealed decision himself - may not request more than said appealed decision granted. It was said that the proceedings, therefore, had to continue on the basis of

the Appellant's **request to revoke the patent** on one hand

and

the Respondent's **auxiliary request to maintain it as amended** by the Opposition Division, i.e. **to dismiss the appeal**, on the other hand.

Moreover, the Board noted that the Appellant in the oral proceedings before the Board had based his argumentation concerning the inventive step of the invention almost exclusively on the prior art disclosed in D4 - which had been seen as the starting point of the invention - and not on the prior art as disclosed by D2 which had been considered to be the closest prior art by the Opposition Division. The Board, therefore found it appropriate to clarify, once more, in that communication its view on the inventive step having regard to the arguments put forward in the oral proceedings more than two years ago.

At the end of the communication it was stated that "without a reply by the parties within the coming two months the Board will take the final decision directly in writing".

XIII. Taking into account that the parties did not reply to the Board's last communication, the requests to be decided upon are those as filed in the oral proceedings before the Board (see under paragraph VIII above).

### **Reasons for the Decision**

1. The appeal is admissible.
2. Due to the fact that the Respondent (Patentee) has himself not filed an appeal he is restricted to defend the patent as maintained by the decision of the Opposition Division which decision was appealed only by the Opponent (see said G 4/93 - cf. paragraph XI above). His main request concerns a set of claims whose

scope is broader than the one of the claims maintained by the Opposition Division and is, therefore, not admissible. The existence of appropriate and necessary amendments allowable according to G 4/93 in this context was not raised by the Respondent, nor can the Board see that the Respondent's main request contains such amendments.

Thus, the Board has to judge upon the Appellant's request to revoke the patent and the Respondent's auxiliary request to maintain it as amended by the Opposition Division, i.e. to dismiss the appeal.

3. The Board has exhaustively analysed the two documents at issue, D2 and D4, and come to the conclusion that none of the teachings of said documents could be used as the starting point of the invention as the devices disclosed in those documents would not lead the skilled person to the idea to design a device according to the invention.
  
4. In particular the Board does not find document D2 so relevant as the Opposition Division. In fact it appears that the features (f) to (g) (see the impugned decision page 5) identified by the Opposition Division and relating to the arrangement according to Figure 2 in D2 are somewhat artificial [i.e. when interpreting D2] and can only have been identified with the hindsight of the present invention. As has been said in the proceedings before the Opposition Division, D2 does not disclose an arrangement for recognition and reception of two different standard frequency signals. It is true that this arrangement has two modes of operation which, however, in no way are concerned with different

frequencies. On the contrary, when a sync signal (either 525 or 525,5 line rate/frame rate ratio) has been received during a certain time period (during two television fields - see column 8, lines 9 to 14) in the second mode of operation (the wide window mode or search mode has been identified as the second mode by the Opposition Division - see feature (g), the arrangement is switched over to the first mode (the narrow window mode has been identified as the first mode - see feature (f)). This first mode, however, in no way changes the operation frequency. On the contrary the arrangement now practically receives sync pulses of the said frequency only that has been found at the search in the wide window operation mode. When no time coincidence is any longer detected by phase detector 68 the arrangement is again switched over to the second mode, wherein the counter 38 indeed counts to a predetermined number (546), but only if no sync pulse is received during the open window period. The said predetermined number (546) therefore apparently cannot correspond to a reception of a second standard signal having vertical sync pulses of a predetermined frequency as has been proposed by present Claim 1. On the contrary when the said counter counts to the said predetermined number (546) no sync signal at all is received.

It therefore appears that the identification of feature (h) made by the Opposition Division is not correct as according to D2 the received frequency signal does not change when switching between the modes (it remains the same or the signal disappears).

So it is in fact hard to see how the skilled person from the teaching of D2 would be able to arrive at the idea that the said arrangement disclosed in said document could be used as a starting point for an arrangement for reception of different standard frequency signals.

It appears that the feature of Claim 1 identified in the 5th paragraph (corresponding to the said feature (h) identified by the Opposition Division) in fact is a key-feature which clearly indicates in which way a change between the modes can be done. The Appellant has criticized this feature and has expressed the opinion that this feature apparently is too general and only identifies the problem to be solved (as identified by the Opposition Division). Having regard to the references cited it appears to the Board that the said feature (5th paragraph) is sufficiently clear and cannot be considered as too general as the references cited do not disclose such teaching as proposed therein (cf. under 1 above).

Moreover, the last feature of Claim 1 (corresponding to Claim 2 of the granted patent-feature (k) according to the Opposition Division) indicates in a more concrete way in which way the change of mode must be done. This change of mode is also clearly distinguished from the teaching of D2, according to which the counter always (both in wide and narrow window operation) is reset by the incoming vertical sync pulses.

Having regard to Claim 3 as maintained the Board is of the opinion that the last feature (l) of the independent Claim 3 appears to disclose an aspect of

the invention which aspect has not been disclosed in D2 (D2 does not disclose reception of two frequencies) and which contributes to the identification of the invention. Thus the invention as claimed is novel and inventive with regard to document D2.

5. The Appellant alleges that when translating the arrangement according to D4 into digital form it would in an obvious way result in the claimed invention. It is true that D4 teaches how to receive two different standard sync pulse signals. However, it does not appear to be such a self-evident step from the teaching of this document to the invention as claimed as alleged by the Appellant. It is in this respect referred to the letter of the Respondent, dated 3 March 1992, page 4. As has been pointed out therein, a skilled person when starting from this document would apparently try to use two counters, which already would lead him away from the invention. Moreover according to D4 synchronisation is always achieved by triggering the sawtooth ramp by the sync pulse and would therefore be similar to the method according to D2.

6. Considering the teaching of D4, in more detail it is true that this document concerns the problem how to make an analog circuit containing a capacitor providing a sawtooth waveform suitable for different oscillating frequencies which correspond to different vertical sync pulse frequencies of a TV-signal. However, an object of D4 is also to solve the problem of how to keep the sawtooth wave amplitude substantially constant as the frequency of the sawtooth wave is switched. This corrects for the 17% change in picture geometry which would otherwise be observed. In fact, most of the

description of the document relates to the arrangements necessary for obtaining this effect.

In order to solve this problem a capacitor (C) is loaded and unloaded by different charging circuits (D4, Figure 1, reference numerals 2 or 6; Figure 3, 22 and 23 or only 22). The switching of the capacitor between the two different charging circuits is according to the only detailed embodiment of the description governed by a sync signal detector 5 (shown in Figure 3). This detector contains an additional capacitors C2, the sawtooth wave of which is used for the detection of the different sync pulses (60 Hz or 50 Hz).

Another possible way of detecting the sync pulses is hinted at in the description (D4, page 9, second paragraph - Claim 12), i.e. the amplitudes of the two different sawtooth waves (corresponding to the two different frequencies) may be fed back to the sync signal detector for identification.

In order to detect a change in the frequency the amplitude of the sawtooth wave over the capacitor C produced in a certain mode of operation (e.g. 50 Hz) is compared with a certain value (V4, Figure 2), which is between the max value (V1) of the 50 Hz sawtooth amplitude and the value (V6) this 50 Hz sawtooth reaches when it is "reset" by a 60 Hz sync pulse before it reaches the max value. When this value (V4) has not been reached during several periods (e.g. 5 to 20 times) the mode of operation is changed to 60 Hz. In the case where the arrangement is working in the 60 Hz mode and is "reset" by a 50 Hz vertical pulse an amplitude value V5 must be exceeded several times

before a switch-over to the 50 Hz mode is executed. This value is between the normal max value V1 of the 60 Hz sawtooth and a higher value V7 achieved when the 50 Hz sync pulse is "resetting" the 60 Hz sawtooth.

The Board notes that the wording of the two independent claims of the present patent is such that no features at all of the claims can directly be read onto the teaching of the document D4. However, the Appellant is of the opinion that D4 represents an analog near-equivalent of the arrangement of the invention which would lead the skilled person in an obvious way to the solution according to the present patent. To the Board, however, this view does not seem to be convincing.

The Board takes the view of the Respondent that the use of two charging circuits of the capacitor C would require the use of two counters, one for each standard when translating the disclosed analog form into a digital form. Moreover, according to the embodiment disclosed in Figure 3 in D4 the function of the disclosed two "counters" (C - having two different charging circuits) would require an additional "counter" (C2) governing the function of the two first counters.

It also appears that the teaching of D4 is distinguished from the technique used according to Claim 1 of the invention by the way the switching between the two frequencies is performed. Thus, according to D4 it is necessary to measure the amplitudes of the different waveforms with complicated analog circuits and detect whether the sawtooth

achieves certain amplitudes (V4 and V5) which do not correspond to the exact frequencies of the waveforms. According to Claim 1 of the patent the counter is reset at the exact predetermined count matched to the exact frequency concerned and when the frequency is changed by the sync pulse.

According to independent Claim 3 it is made clear in which way the only counter according to the invention is working when in the second mode. This feature cannot at all be compared with the teaching of D4, since D4, as has been made clear above, requires different "counters" for different frequencies.

Moreover, alone the fact that the teaching of D4 does not mention the existence of horizontal sync pulses appears to make a comparison between the claimed invention and the arrangement according to D4 difficult. It is clearly because of the horizontal oscillator producing the horizontal sync pulses that it is possible to use only one counter and to arrive at the invention. D4, on the contrary, only mentions the existence of vertical sync pulses, which alone govern the sawtooth waveform.

The Appellant has tried to convince the Board that the teaching of D4 represents the analog equivalent of the claimed invention. The Board, however, cannot see this equivalence, as has been shown above. Instead, it is inclined to believe that such equivalence seen by the Appellant can only be derived with considerable hindsight.

7. It is true that the teaching of D4 discloses an analog circuit which can receive two different standard sync pulse signals and that theoretically a technical problem could be derived from this teaching and seen therein that said analog circuit should be turned into a corresponding digital device. However, as has been shown above no features of the present independent claims of the present patent can directly be read onto the teaching of D4. Moreover, said analog circuit, in fact, discloses features which, even when they would be "converted" into the digital form, would not lead to the invention because those features would not correspond to the features of the invention. Instead they would lead to a different design and would have a different interrelationship between each other than the features of the claimed invention.

Also, there are no hints in the two documents, D2 and D4 which would lead the skilled person to combine the said two references - even when doing so, it is not to be realized (and it has not been shown by the Appellant) in which way the skilled person would arrive at the invention as claimed. Thus, the discussed prior art does not provide any indication which would have led the skilled person to the proposed solution.

Thus, it appears that neither the teaching of D4 alone, nor in combination with the teaching of D2 would lead the skilled person to the invention.

After the foregoing analyses of the documents D2 and D4 it appears that the prior art disclosed in the introductory part of the present patent description, in fact, indicates the most reasonable starting point of

the invention and gives rise to the realistic (and objective) problem how to provide TV circuitry including one vertical sync counter capable of automatically distinguishing between different TV line standards (cf. the introductory part of the description of the patent under "Background of the invention" - in particular see lines 35 to 52). Thus "separate decoding circuits for decoding picture information being transmitted at different line standards" are no longer necessary in TV receivers using the invention. As can be understood from the analysis of the teachings of the said documents D2 and D4 they cannot contribute to the solution of said problem, in particular not, because the teaching of D2 is in principle concerned with one signal frequency only and the teaching of D4 does not even disclose a vertical sync counter in the sense of the invention.

8. The Board, therefore, is convinced that the subject-matter of the independent Claims 1 and 3 is not obvious (Article 56 EPC).
9. In view of the above the contested decision is to be confirmed and the auxiliary request of the Respondent to maintain the patent according to that decision is to be granted.

## **Order**

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

1. The request of the Respondent as far as it goes beyond the patent as maintained in the contested decision (main request) is rejected as inadmissible.
2. The appeal is dismissed.

The Registrar:

The Chairman:

M. Kiehl

P. K. J. van den Berg