D E C I S I O N
of 31 March 1994

Case Number: T 1055/92 - 3.5.1

Application Number: 86200750.7

Publication Number: 0201130

IPC: G06F 15/62

Language of the proceedings: EN

Title of invention:
System for spatially transforming images

Applicant:

AMPEX SYSTEMS CORPORATION

Opponent:
—

Headword:
—

Relevant legal norms:
EPC Art. 76(1), 83, 84, 123(2)

Keyword:
"Clarity"

Decisions cited:
—

Headnote:
I.   The form and content of the claims in a European patent
application are governed by the requirements of Article 84 and
Rule 29 EPC.

According to Article 84, the claims shall define the matter for
which protection is sought.

.../...

Headnote cont'd:
This function of the claims should be clearly distinguished
from the requirement that the European patent application must
disclose the invention in such a way that it enables a person
skilled in the art to carry out that same invention.

II. Under Article 83, sufficient disclosure is required of a
European patent application, i.e. of the application as a
whole, comprising the claims, together with the description and
the drawings, but not of an individual claim as such.

III. A claim in a European patent application must comprise the
essential features of the invention (cf. T 32/82, OJ EPO 1984,
354); the essential features should in particular comprise
those features which distinguish the invention from the closest
prior art.

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Case Number: T 1055/92 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 31 March 1994

Appellant: AMPEX SYSTEMS CORPORATION
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                            California 94063-3199 *(US)*

Representative: Horton, Andrew Robert Grant
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Decision under appeal: Decision of the Examining Division of the
                            European Patent Office dated 29 September 1992
                            refusing European patent application
                            No. 86 200 750.7 pursuant to Article 97(1) EPC.

Composition of the Board:

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

Summary of Facts and Submissions

I.   Appellant's European patent application
        No. 86 200 750.7, filed on 1 May 1986, which is a
        divisional application of an earlier application
        (publication No. 0 076 259), filed on 10 April 1981, was
        refused by a decision of the Examining Division dated
        29 September 1992.

II.   The reason given for the refusal was that Claim 1 did
        not meet the requirements of Article 84 EPC.

        In particular the Examining Division stated that the
        last paragraph of Claim 1 was vague and indefinite. It
        contained phrases which did not define the matter for
        which protection was sought in terms of technical
        features of the invention in a clear and concise manner,
        because it was not clear how the values of the command
        parameters for fields between successive knots were to
        be computed in terms of the values of the respective
        command parameters and their derivatives at the knots.

III.   On 27 October 1992 the Appellant filed a notice of
        appeal against that decision, paying the appeal fee on
        the same day. The Statement of Grounds was filed on
        2 November 1992, accompanied by a set of Claims 1 to 7.

        The independent Claims 1 and 6 read as follows:

        "1. A control system for an image transformation system
        (1300) which is operable to act on input arrays of data
        samples representing video fields to compute, for each
        of a multiplicity of fields in a sequence, a modified
        array of data samples in accordance with the values in
        respect of that field of a plurality of command
        parameters which determine for each field a spatial

transformation of an image represented by the respective
input array of data samples, the control system
comprising:

means (1422, 1424, 1308, 1310) for selecting the said
multiplicity of fields in the sequence;

means (1428, 1308, 1310) for programming a plurality of
knots, which are few in number relative to the
multiplicity of fields in the sequence and which are
represented by selected fields and which comprise an
initial knot, a final knot and at least one intermediate
knot;

means (1410, 1426, 1308, 1310) for setting values of
selected command parameters for each of the knots; and

a controller (1314) which (1) stores the set values of
the selected command parameters for each of the knots;
and (2) computes values for each of the said command
parameters for fields between successive knots (a) in
accordance with the values of the respective command
parameter at preceding and succeeding knots and (b) in
accordance with the values of the slope or first
derivative of the respective command parameter at the
said preceding and succeeding knots, so that the spatial
transformations provide a smooth and continuously
changing video effect.

6.   A method of controlling an image transformation
system (1300) to produce a complex and continuously
varying video effect extending over a sequence composed
of a multiplicity of video fields without sudden
stepwise change, comprising the steps of:

selecting the image manipulation variables for the video effect and selecting the said multiplicity of fields in the sequence;

specifying knots corresponding to selected fields in the sequence, the knots including a first knot, a final knot and at least one intermediate knot;

storing for each of the knots a plurality of parameters which each specify, at each knot, the state of a respective image manipulation variable;

computing the said parameters for fields between knots in accordance with the values of the respective parameter at preceding and succeeding knots and in accordance with the values of the slope or first derivative of the parameter at the said preceding and succeeding knots, whereby to provide for each field in the sequence the said image manipulation variables; and

providing the thus computed image manipulation variables to the image transformation system as transformation commands."

Claim 1 is distinguished from refused Claim 1 only in that the expressions "in terms of" in the last paragraph of the claim (after (a) and (b) respectively) have been changed into "in accordance with". Claim 6 is identical to Claim 6, filed on 15 November 1990.

IV.   In support of his request, in the Statement of Grounds of Appeal the Appellant expressed the opinion that the Examining Division had confused Articles 83 and 84 EPC. The Statement of Grounds of Appeal concluded that:

"the decision under appeal fails signally to discuss the alleged lack of clarity in the context of what purpose the claims are to fulfil. The rejection rests on, in essence, two assertions only. The first is that the last part of the claim is "vague and indefinite because it is not clear how the values are to be computed". The second is that "claim 1 would have to state the necessary detail that a person skilled in the art would be enabled to perform the invention". Neither assertion, in the submission of the Appellant, is adequate to demonstrate lack of clarity. Generally, the language employed is pertinent to a lack of sufficient description of the invention: the second statement is practically a paraphrase of Rule 27(1)(f), which requires that the "description shall ... describe in detail at least one way of carrying out the invention ...". More particularly, the assertions do not begin to demonstrate what essential feature, by any test pertinent to the claims, is missing from the claims or in what manner, pertinent to the functions of the claims, the language is unclear. The rejection is accordingly, in the submission of the Appellant, improperly made under Article 84."

Moreover, the Appellant pointed out that in the oral proceedings the Examining Division confirmed that there was no objection with regard to insufficiency according to Article 83 EPC.

The objection as to clarity made by the Examining Division was said to concern only the last paragraph of Claim 1. The Appellant made the following exhaustive analysis of that paragraph:

"4.11. The final paragraph of claim 1 has three parts, the first of which concerns the storage action of the controller (1314) and the last two of which concern the

1541.D   .../...

interpolating action of the controller. It is appropriate to deal with each in its turn and it will become apparent that each is a necessary technical feature expressed in clear and appropriate terms.

4.12.   The first part states that [the controller] stores the set values of the selected command parameters for each of the knots. This part, which is not in dispute, concisely states the action of the controller as disclosed at page 52 line 23, page 53 line 5 and, in the specific example, at page 64 lines 34 and 35 and elsewhere.

4.13.   The second part states that the controller computes values for fields between successive knots (a) in accordance with the values of the respective command parameter at the preceding and succeeding knots. This is intended to indicate concisely the action which is described in several ways, as follows:

(i)   [The high level controller] "between the set times interpolates between the preceding and succeeding states for each control parameter" (c.f. page 52 line 30).

(ii)   "Interpolating between the set points" (c.f. page 52 line 35).

(iii)   "Between knots, each parameter is interpolated between its state at the preceding and succeeding knots [with a third degree polynomial equation, the coefficients of which] are <u>computed</u> in terms of the <u>value</u> of the parameter <u>at the current and succeeding knots</u> and the value of the slope or first derivative of the parameter with respect to time at the current and preceding knots". (See above page 53 lines 21 to 32.) [Emphasis added]

It may be observed that there is hardly any purpose to
an interpolation unless it is "in accordance with" the
values of the parameter at the selected fields. The
interpolation which the present invention provides is
analogous to construction of an interpolant for a set of
non-colinear points in a two-dimensional field of which
ordinate values are known for a few abscissa values, the
ordinate values being represented in the present
invention by the parameter and the abscissa by time. It
is beyond doubt that a meaningful interpolation has to
take into account the known values.

4.14.   The final part of claim 1 refers to the
computation of the values of the parameters being "(b)
in accordance with the values of the slope or first
derivative of the respective command parameter at the
preceding and succeeding knots, so that the spatial
transformations provide a smooth and continuously
changing video effect".

4.15.   Although there is no dispute that this final
part of the claim is properly based on the description,
the relevance of it to the claimed subject-matter might
not be as immediately apparent as the foregoing feature.
However, the significance is not difficult to derive
from the nature of the desired effect and elementary
mathematics, confirmed by the published work cited in
the application.

4.16.   The desired effect is a smooth and continuously
changing effect. The starting data consists of the
values of the parameter for relatively few fields in a
sequence."

Following that analysis, the Appellant referred to a
textbook by de Boor, cited in the description of the
application, going on to show that interpolating

techniques such as those referred to in Claim 1 and in
the description of the application had been well
established by 1981 and relied on different
interpolation methods. The Appellant referred to an
example given in said textbook (page 49) which was said
to be directly applicable to the interpolation required
for the present invention. According to this example,
"the interpolant is in accordance not only with the
(stored) parameter values at the relevant set points but
also in accordance with the first derivative of the
parameter at the relevant set points". The Appellant
said that the author of the textbook started from an
interpolating technique known as "piecewise linear
interpolation". This technique, however, was very rough
and the author, therefore, indicated that:

"both for a smoother approximation and for a more
efficient proximation one has to go to piecewise
polynomial approximation with higher order pieces" and,
moreover, that "the most popular choice (though
obviously not the only choice - Appellant's remark)
continues to be a piecewise cubic approximation
function."

The Appellant summed up the argument, asserting that,
(having regard to Article 84 EPC) the language of
Claim 1 was clear and that it correctly identified the
protection sought for the invention. It, moreover,
contained all necessary "essential features", first, in
the sense that all the features described in the
description as necessary for the performance of the
invention were present in Claim 1 (i.e. they were
supported by the description) and, secondly, in the
sense that all essential features were present to enable
the invention to be distinguished from the prior art.

Moreover, the Appellant pointed out that the decision
under appeal did not treat the status of Claims 6 and 7,
filed on 15 November 1990, correctly. At no time had the
Appellant (Applicant) abandoned those claims.

V.   The Appellant therefore requested that:

    (i)   the decision of the Examining Division be set
           aside;

    (ii)   that the application be allowed to proceed to
           grant with the following supporting documents:

           Claims 1 to 7 as filed on 2 November 1992,

           description pages 1 to 3 filed on 2 November
           1992 and pages 4 to 91 as filed on 15 July 1989,

           drawing sheets 1 to 10 and 12 to 19 as
           originally filed, and sheet 11 as filed on
           15 July 1989;

    (iii)   that oral proceedings be appointed in the event
           that the Board of Appeal were unable to accede
           to request (ii) or any alternative request
           formulated in the Grounds of Appeal (the
           Appellant had in the Grounds of Appeal declared
           that he was prepared to change the language in
           the claims, were the Board to consider this
           necessary, e.g. to change "in accordance with"
           in the last paragraph of Claim 1 into "in
           response to" or "in dependence upon").

Reasons for the Decision

1.   The appeal is admissible.

2.   The ground for the refusal of the present application by
        the Examining Division according to the decision under
        appeal was that:

        "the application does not meet the requirements of
        Article 84 EPC, because Claim 1 is not clear".

        In order to be able to decide upon this issue, it is
        necessary to establish what the invention is, in
        essence, about.

3.   Having regard to the fact that in the decision under
        appeal the Examining Division has not mentioned any
        prior art document, it appears appropriate to the Board
        to consider the technical problem, identified by the
        Appellant, to be the objective problem to be solved by
        the invention. The Appellant in its Statement of Grounds
        of Appeal considered that the first paragraph of Claim 1
        defined the starting point of the invention and,
        therefore, identified the problem to be

        "how to achieve a repeatable sequence of command or
        control parameters for an image transformation system
        which ... is operable to act on input arrays of data
        samples representing video fields to compute for each of
        a multiplicity of fields in a sequence, a modified array
        of data samples in accordance with the values **in respect
        of that field** of a plurality of command parameters which
        determine for each field a spatial transformation of an
        image represented by the respected input array of data
        samples".

At first sight, as the Appellant has noted, it appears
to be necessary to determine and store a large number of
command parameters for a transformation sequence.
However, according to the invention a sufficiently
accurate representation of the transformation can be
provided by storing values for the command parameters
for only a few selected fields ("knots") and to
interpolate the values for the fields between the
"knots".

To the Board it appears that in Claim 1 the three
paragraphs following the first introductory paragraph
are perfectly clear having regard to the language used.
They make clear that means must be contained in the
control system which (1) select all the fields in a
sequence, (2) program the said knots which are few in
number relative to all the fields in a sequence; and (3)
set values of selected command parameters for the said
"knots". In fact, it appears that the Examining Division
did not consider the paragraphs mentioned so far to be
unclear.

To the Board the key-idea of the invention appears to be
given in the third paragraph of Claim 1, i.e. that only
"knots" (which are few relative to the number of fields)
are programmed. The features according to the last
paragraph of Claim 1, specify how this idea is performed
in practice. The teaching of the last two lines of this
claim, which only indicates the desired result to be
achieved by the invention, does not represent a true
technical feature. Nevertheless, it roughly indicates
the conditions and the restrictions for the computing
mentioned in the first part of the paragraph.

As has been shown above, Claim 1 is clear in the sense
that it uses a language that is clear and does not give
rise to misinterpretation of its wording. Thus, the

Board in this case finds that the requirements of the first part of the second sentence of Article 84 EPC are fulfilled, i.e. that "they (the claims) shall be clear and concise".

4.   According to the decision under appeal Claim 1 lacks clarity, in particular, "because it is not clear how the values of the command parameters for fields between successive knots are to be computed in terms of the values of the respective command parameters and their derivatives at the knots". With regard to this issue, the Board, has reached the opposite conclusion:

According to Article 84 EPC, first sentence, in a European patent application "the claims shall define the matter for which protection is sought". Therefore, the primary function of a claim is to set out the scope of protection sought for an invention. This implies that it is not always necessary for a claim to identify technical features or steps in detail. Thus, the Board cannot agree with the Examining Division's decision where it is stated that "in order to be clear, Claim 1 would have to state the necessary computations in such a degree of detail that a person skilled in the art would be enabled to perform the invention without exercising inventive skill". The Board considers that it is sufficient if the application as a whole (the claims together with the description and drawings) describes the necessary characteristics of an invention (in this case the computation) in a degree of detail such that a person skilled in the art can perform the invention. This requirement, however, relates to Article 83 EPC and is not relevant to Article 84 EPC.

The content of claims is governed by the requirements of Article 84 and Rule 29 EPC. Under Article 83 EPC sufficient disclosure is required of an application as a

whole (claims together with the description and
drawings), but not of a patent claim as such.

5.   However, the Board also agrees with the Appellant's
interpretation of the meaning of the second part of said
second sentence of Article 84 EPC (as regards the
requirement for the claims to be supported by the
description - cf. paragraph IV above), in that all the
features described in the description as being necessary
to carry out the invention (essential features) must be
present in a corresponding claim (cf. T 32/82, OJ EPO
8/1984, 354-356).

Thus, features which are necessary to solve the
technical problem concerned must be present in the
claim. During proceedings before an Examining Division,
it often happens that pertinent documents are cited with
the result that the core of a claimed invention has to
be changed and also the corresponding problem to be
solved appears in a modified form. In such cases often
new essential features must be added to the claim in
order to clearly identify the solution and to
distinguish the invention from the prior art.

In the present case the Examining Division has not
mentioned any documents in the light of which such
essential features of the present Claim 1 could be
identified to distinguish the invention from the prior
art. However, when the prior art and the starting point
of the invention is considered to be such as proposed by
the Appellant, it appears (cf. paragraph 3 above) that
the core of the invention is to be seen in the provision
of knots from which other parameter values are somehow
computed. Since no pertinent prior art has been cited
against the present application, disclosing
interpolation between knots as being known in what can
be considered to be the technical field of the present

invention, or a closely related field, *prima facie*, it
appears that the subject-matter of Claim 1 at the
present stage of the proceedings is clearly
distinguished from the prior art mentioned by the
Appellant. In the opinion of the Board no further
specification of the invention in the claim c.q.
distinction from the prior art is required under
Article 84 EPC. For these purposes functional features
may suffice in a claim.

6.   It appears from the decision under appeal that the
      Examining Division, as suggested by the Appellant (cf.
      last four lines of paragraph IV, above), mistakenly
      considered Claims 6 and 7, filed on 15 November 1990, as
      having been abandoned. Thus these claims were not taken
      into further consideration. To the Board, it appears
      that independent Claim 6 is, in principle, intended to
      identify a method corresponding to the system according
      to Claim 1. The wording of Claim 6 has, however, not yet
      been adapted to the present Claim 1.

7.   Since the Board is of the opinion that the Appellant
      should have the possibility to have this application
      examined with regard to all the requirements of the EPC
      by two instances, in application of the Board's
      discretion pursuant to Article 111(1) EPC, further
      examination of the present application is left to the
      Examining Division.

      In this context, the Board notes that, according to the
      decision under appeal, the only ground of the refusal
      was lack of clarity of Claim 1.

      This is also the only issue the Board has formed a
      judgment on in this decision and it has decided that
      Claim 1 as it stands, at the present stage of the
      proceedings, satisfies the requirements of Article 84

EPC in that Claim 1 is clear and concise. However, in arriving at this decision, the Board has based its opinion to a large extent upon the statements of the Appellant.

In order not to deprive the Appellant of an examination by two instances and considering that Boards of Appeal are primarily concerned with judging upon appeals and not with examining European patent applications, the Board has not investigated whether the application, as it stands now, satisfies Article 76(1) EPC (content in relation to parent application), Article 84 EPC, second part of second sentence (support of the claim by the description), Article 123(2) EPC (applicability to a divisional application), nor in how far the invention as claimed might fall under the exclusions of Article 52(2) EPC.

Should it be necessary to examine the inventive step of the invention, the Board would like to point out, that in the communication of 8 May 1985 by the Examining Division in charge, the subject-matter of published, amended Claim 22 of the parent application, the subject-matter of which represents the core of the present Claim 1, was considered to be obvious to a skilled person having regard to the prior art documents cited in those proceedings.

8. With regard to the Appellant's request for oral proceedings in case the Board were unable to allow the application to proceed to grant on the basis of any of the Appellant's requests, the Board notes that, under the present circumstances, where proper examination of the application in respect of all the requirements of the EPC, other than those under Article 84, has not yet even been started, it seems neither appropriate nor expedient to summon the Appellant to oral proceedings

before the Board. In the case of remittal by the Board
to the first instance, as at present, oral proceedings
before the Board are likely to prejudice the first
instance.

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 for further
        prosecution on the basis of the application documents
        specified in paragraph V(ii) above.

The Registrar: The Chairman:

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